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THE AIMS OF THE MEDICAL PROFESSION AS THEY RELATE TO THE PUBLIC

PRESIDENT'S ADDRESS

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The doctor has long been considered an individualist; in some quarters he is still so regarded. This should be accepted as a compliment as far as the diagnosis, treatment and confidential relationships of private practice are concerned. The physician's absorption in and devotion to the development of the ever widening field of medicine, his concentrated interest in the solution of the problems presented by individual patients, his sense of personal responsibility in the welfare of each patient quite naturally tended to the growth of habits of mind and thought that characterized him as an individualist. Such a mental attitude has been and still is necessary in the practice of curative medicine, constituting an essential attribute in its successful application. The result of the application of a constantly growing medical knowledge has become as apparent to the patient as to the community, of which he is but a part. With this has come to the doctor a realization that as an integral and important part of the community his interests are far wider than those embraced in treating the individual. While this is still one of his major functions, the conception that it is his sole duty is narrow. To this function have been added others which to the public are of greater importance; namely, the maintenance of health and the prevention of disease. Now that social and economic changes have disrupted what were formerly regarded as established policies in both the social and the professional aspects of organized society, the physician finds other problems and duties to which professional responsibility demands that he give attention.

MEDICINE AS A PROFESSION

Medicine is a profession, the sole social reason for its existence being the service it can render humanity; financial gain is a subsidiary consideration. The American Medical Association was formed in 1847 with the avowed purpose of furthering the art and science of medicine and of rendering service to humanity. That service is further interpreted as the maintenance of health and the postponement of death. It is not a trade union and does not concern itself specifically with the rate of compensation, the hours and place of work: it builds no trusts, founds no monopolies, excludes no qualified competitor and retains for its profit no worthwhile discovery; it engages in no political activity, calls no strikes and answers alike calls from the storm and windswept country, the streets of the village, the boulevards of the city and the desolate field of battle. It does observe the qualification of those desiring to engage in the practice of medicine, their integrity and probity. It demands that the medical service dispensed by every physician meet the standard which it has set; namely, that it be good medical care.

THE RISE OF PREVENTIVE MEDICINE

In view of the present agitation by would-be reformers, it is well to bear in mind that all the improvements in medical service during the past fifty years have been initiated in and put into operation by the medical profession without compulsion, political, governmental or otherwise. A consideration of your time and patience forbids detailed enumeration, but certain definite results may be mentioned. Plagues no longer decimate our population; the toll of the infectious and communicable diseases has been stayed; typhoid is all but a thing of the past; infant and child mortality have been curtailed and tuberculosis, formerly known as the Captain of the Men of Death, has been made to give ground until the mortality from it now is but one fourth that at the beginning of the century. There has been a reduction of 50 per cent in the total mortality and an increase of nearly 100 per cent in longevity—a truly remarkable social phenomenon.

MEDICAL EDUCATION

Medical schools, as a result of more stringent requirements, have been decreased in number, the courses of instruction augmented and prolonged, so that the graduate of today is a competent mentor for the sick. This contribution on the part of the American Medical Association to the elevation of the standard of American medicine has been made at the expenditure of much time, effort and money. The results of this outlay of its capital have fully justified the wisdom and altruism of such a course. The medical schools of this country today are equaled by but few and surpassed by none of other countries. Notwithstanding the increased educational standard, the number of graduates today remains the same as under the old régime in operation at the beginning of the century, while the output is of a superior quality, affording assurance of the maintenance of a higher standard of medical practice. The most valuable asset possessed by the medical profession is the constantly accumulating fund of knowledge in the minds and the literature of its members. Since "a profession has for its prime object the service it can render humanity," all its knowledge must

President's address before the American Medical Association at the Eighty-Ninth Annual Session, San Francisco, June 14, 1938.

be available for the attainment of that object. In directing the education of those who would enter its portals, the medical profession is but fulfilling its responsibility to the public not only in making its fund of knowledge available to the student but in requiring of him evidence that he has acquired it in sufficient amount to make him a safe exponent of its dispensation. Hospitals of fifty years ago were but boarding houses providing creature comforts for the sick: today they are institutions affording not only ample accommodation but, as well, trained personnel, technical equipment, adequate nursing, competent staffs and means for carrying out scientific procedures. These attributes insure an efficient service meeting the requirements which modern medical knowledge and humanitarianism demand as the unequivocal right of the sick at the hands of those to whom they entrust their welfare. Medicine with its component special fields has advanced until it has become more and more a science, its accumulated knowledge being dispensed through and with the art of its votaries. Approximately twelve million patients are treated yearly in the hospitals of this country with a mortality, in the approved hospitals, of slightly less than 4 per cent. When one considers that this covers all known causes of death, there is reason for gratitude that modern medicine has surrounded hospitalization with such effective safeguards. These improvements in medical education and in hospital service have entailed the expenditure of more than a million dollars by organized medicine and represent a contribution in service of no little import to the welfare of our fellow citizens.

THE PROBLEMS OF PSYCHIATRY

Psychiatry throughout the past century has been a veritable *terra incognita:* only when the injunction *sit lux* of modern science was applied to it has it emerged from the gloom and darkness with which it was enshrouded. Asylums were but domiciliary institutions for the confinement of the mentally ill. From these archaic structures modern hospitals are arising, staffed by competent personnel, registered nurses and aiders versed and trained in psychiatry, meeting the challenge of the disordered mind with an orderly mind skilled in the application of scientific, psychiatric knowledge. In some measure dementia paralytica is responding to fever therapy, dementia praecox to insulin and metrazol shocks, involutional melancholias to endocrine therapy. Functional psychoses are being corrected. As a result the percentage of restorations to community life shows a yearly increase.

THE GENERAL PRACTITIONER AND PREVENTIVE MEDICINE

While the major responsibility for preventive medicine devolves on the United States Public Health Service and the state and local health officers, the physician in practice has come to a realization that his obligation to society demands an extension of activity beyond the intimate personal relationship between the individual patient and himself to the broader field of preventive medicine. He is widening his sphere of responsibility from the care of patients to that of the community of which the patients are a part. Sanitation, immunization, maternal and child welfare, antepartum care, public health nursing, mental and social hygiene are a part of this program. An interested public participates through many worth while organizations, of which the Society for the Prevention and Control of Cancer, the National Tuberculosis Association, the League for the Prevention of Blindness, mental hygiene and parent-teachers associations and others are doing excellent work. Legal enactments permitting sterilization of the unfit and requiring a clean bill of health on the part of those who would enter the marriage state, while more specifically in the field of eugenics, give further evidence of the interest of the public in this general program. Today a large bulk of scientific medical measures of vast value in both preventive and curative medicine must wait until the level of the intelligence of the people is prepared to accept them. Schaudinn in 1905 discovered Spirochaeta pallida, Wassermann in 1906 introduced the serum diagnosis of syphilis, and Ehrlich and Hata in 1910 discovered arsphenamine: yet only in 1937 was the word syphilis permitted in the public press and on the radio. For years every physician has sensed the ravages of the social diseases and the beneficent results that would follow their eradication or control, but it remained for Surgeon General Parran to force this recognition on a prudish, recalcitrant public. It has been truly said that preventive medicine forms the keystone of the triumphal arch of modern civilization, since the prevention of disease, and therefore the prevention of suffering and death, is a more important and glorious achievement than the cure of the individual or the reduction of mortality from a given disease. A noteworthy accomplishment, largely attributable to prevention, has been the increase in life expectancy, which now stands at 61 years, indicating that we are slowly developing a society in which old age with its degenerative conditions will represent a constantly increasing percentage of disease.

GRADUATE EDUCATION AND THE SPECIALIST

The growth and development in the art and science of medicine during the present century have been unprecedented: its accumulation has been so rapid and so extensive as to upset all previous conceptions both as to its acquisition and as to its distribution. Not only is the recent graduate perplexed in preparing himself for a special career in medicine, but the graduate of some years who has not kept abreast of the current finds himself wofully lacking in the newer knowledge and procedures, with a consequent failure in understanding of their principles, application and usefulness. Realizing the elimination of this deficiency to be one of its obligations to the public as well as to the profession, organized medicine is providing ways and means of graduate education for those who desire to become specialists and opportunities for the further training of those who are not specialists. In the past the term specialist has been loosely applied. While many had taken the training to fit them for such an appellation, there were those whose only claim to such distinction was a vocal one. In the future the stamp of approval of the various specialty boards will clearly indicate both to the profession and to the public those who have taken the requisite training and who have given a satisfactory demonstration of their fitness before obtaining certification as specialists.

HOW ORGANIZED MEDICINE PROTECTS THE PUBLIC

The American Medical Association maintains a number of bureaus whose activities are directly concerned with public welfare. The Bureau of Health and Public Instruction is specifically concerned in the dissemination of health information to the public by

means of correspondence, by cooperative relationships with organizations interested in public health, by radio through network programs and by service to the public in answering by mail the many thousands of questions coming to it annually. Methods have been devised for the protection of the public health and put in operation through the Council on Pharmacy and Chemistry, the Council on Foods, the Bureau of Investigation, the Council on Physical Therapy, and to a lesser extent in other departments in determining and enforcing standards of value and of advertising used in the sale to the public or to physicians of various articles and services purporting to be of value in the maintenance of health and in the treatment of disease. The rules adopted by the Council on Pharmacy and Chemistry illustrate the application of a system of ethics based on the supreme good of protecting public health. They bar all secrecy as to ingredients and demand that claims be supported by scientific tests, that all advertising must be truthful and that drugs the administration of which should be accompanied by medical diagnosis and supervision be not sold directly to the public. These are simple, straightforward rules the social desirability of which in the whole field of advertising few would dare openly to deny. It is equally axiomatic that they could be made legal only against the strongest possible opposition from those who profit by deceiving the consumer.

DISTRIBUTION OF MEDICAL SERVICE

In the economic upheaval and resultant change in the social and economic structure of our country in the past few years, much has come about that is at wide variance with what heretofore has been regarded as fixed and established policies. There has been a tendency to impress commercial and financial patterns on all features of society, including medicine. A corollary of the tendency to emphasize mechanical devices is the attempt to standardize medical procedures and to provide them on a low cost, mass production scale. Such attempts are based on the belief that a human being can be regarded as a uniform, standardized organism. This is a fundamental fallacy; no two people react in the same way to the same disorder. There is no way to standardize the infinite variety of human beings in health and disease. There has been abuse and criticism of the medical profession with an insistent demand that it propose a plan for a wider distribution of medical service. The difficulties of supplying needed medical care differ almost as widely as do the states constituting this vast nation. Our population is not homogeneous: the labor element recruited from various European countries congregated in the cities of the North and East differ materially from the Negro of the South and from the labor population of our Southwestern states. The geographic distribution of population and of hospital and medical facilities varies from the densely inhabited Northeast to the sparsely settled South and West. The economic level in the various counties and states of the nation alternates from pauperism to opulence. To formulate a program to meet the actual needs of the indigent and partially indigent is no simple task. The trial and error experience with social and economic programs on the part of the federal government in recent years affords ample proof of the difficulties and disappointments encountered. When we face the fact that social and economic factors are inextricably bound with the distribution of medical service to the indigent and partially indigent, the intricacies of the problem become apparent. Organized medicine from prolonged and intimate observation is fully cognizant of the social and economic needs that lie so heavily on the indigent and the low income groups; while willing and solicitous to do its share in their care and rehabilitation by supplying good medical service to those who require it, the profession of medicine does not feel it a responsibility to initiate or sponsor measures looking toward social and economic reformation. At the same time it resists efforts and proposals that would include and regiment its services under lay or political control for the accomplishment of these ends. There is no definite means of computing in monetary valuation the service voluntarily rendered these groups during the past eight years, but from such data as are available a fair estimate based on a minimum fee schedule would place it in the neighborhood of a million dollars a day, a contribution not equaled or exceeded by any agency other than the federal government. Surely this offering for the public good would indicate that medicine has more than fulfilled the obligation implied in its Principles of Medical Ethics to give of its services to the needy and that as a profession our ideal and our aim have been the provision of service rather than solicitation for compensation. During this period more than 250 plans for the distribution of medical service to the low income groups have been tried in various parts of the country, and as a result much useful data and information have been accumulated. Organized medicine insists on a high standard of value in medical service. Any plan or proposal for wider distribution must be judged on its consonance with good public policy and the maintenance of such a standard.

DEFECTS OF STATE MEDICINE

A study of state-controlled medicine in other countries judged by these standards shows the following defects:

1. There is no decrease in the cost of medical care: the system adds a staggering administrative cost.
2. Public health and preventive medicine are not assisted or advanced.
3. Overmedication is encouraged.
4. The burden of cost is distributed over the low income class, which is least able to bear it.
5. Medical care for the indigent is omitted.
6. Graduate education is not encouraged.
7. The hospital load is increased and hospitals are encouraged to practice medicine.
8. Diagnosis and treatment are mechanical and superficial.
9. Medical service becomes a political issue and its control is placed in the hands of unqualified nonmedical workers and organizations.

These are only a few of the characteristics of the systems of state-controlled medicine. Even at its best do the American people and the American physicians want such a system?

CRITERIA OF GOOD MEDICAL SERVICE

The medical profession has not discharged its entire obligation to society by healing the sick and preventing disease. Its broader obligation lies in a concerted determination and effort to preserve that form of medical practice which best conforms to good public policy and which will perpetuate the free, independent, scientific and ethical institution of medicine. It must vigorously resist all efforts that are likely to provide sick people with the mere dregs of a medical service or that are destined to reduce medicine to serfdom. Any proposed change is to be evaluated by certain criteria.

Would it provide better doctors than are now available?

Would it make good medical care more available to the indigent, the unemployed and the low income groups?

Would it enable physicians to devote more time to the care of the individual patients, especially to the seriously ill patients?

Would it provide more time and more inducement to physicians to keep up to date in their professional work by postgraduate study and clinical work?

Would it eventually reduce the average duration of illness in the United States?

Would it maintain or improve the present standards of preventive medicine?

Would it continue to attract the highest type of men and women into medicine as a life work?

Would it reduce or increase the national cost of medical service?

The American Medical Association with the cooperation of county medical societies, state and local health agencies, hospital authorities, the dental, nursing and correlated professions, welfare agencies and community chests has been prosecuting a vigorous study in each county of the entire country in order to determine the prevailing need for medical and preventive medical service, where such may be insufficient or unavailable. In other words, it is fulfilling its mission in a way characteristic of the doctor, the American public being the patient and organized medicine being the attending physician. When careful search has revealed the diagnosis, appropriate treatment will be applied. Efficient and ethical means can then be devised for the distribution of medical services to all people on the basis of need rather than to small groups within the population according to political expediency or special interests. Thereby it becomes possible for organized medicine to act specifically as a clearing house in the initiation, development and functioning of what may well evolve into a comprehensive system of medical care for all the people according to the American plan of medical practice.

THE AIMS OF THE MEDICAL PROFESSION

The aims of the medical profession as they relate to the public may be briefly summarized:

1. Maintenance of the present high standard of medical education, affording assurance that the graduate is competent to care for the sick.

2. Adequate provision for graduate education, with specified training for the development of specialists, and continued training for those who are not specialists so that the level of professional efficiency may be raised.

3. Extension of public health and preventive medicine to cover the field adequately.

4. Continuation of the practice of ethical scientific medicine on its present high plane.

5. Protection of the public against medical frauds falsely labeled foods, drugs and appliances.

6. The widest possible dissemination of health information to enable the public to act intelligently in the preservation of its health and in the prevention of disease.

7. The development and consummation of plans for extension of medical service to all groups of the population consonant with our established high standard of quality.

321 West Broadway.

IMPORTANCE OF RESTORATION OF BLOOD SUPPLY IN FRACTURES OF NECK OF FEMUR

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The subject I have chosen for this paper is the question of blood supply in fractures of the neck of the femur. Because of the possibility of inadequate blood supply, it is my belief that the treatment of this fracture is a special problem differing from that of all other fractures. It is the most unfavorable of all fractures as to union, so unfavorable that Dr. Kellogg Speed of Chicago, when invited to deliver an oration on fractures before a recent congress of the American College of Surgeons, chose this particular fracture as his subject, designating it "the unsolved fracture." It may also be noted that Sir Ashley Cooper went on record as having said that he had never seen a fracture of the neck of the femur that had united.

The British Commission on Fractures has reported 22 per cent of union in all types of treatment of fractures of the central neck of the femur. In 1929 and 1930 a committee of the American Orthopedic Association studied this problem, making a survey of certain clinics in which as low a figure as 30 per cent of union was claimed. Two hospitals in New York have within the past four months announced statistics showing 38 per cent of union, while a third hospital reported 46 per cent. In this connection, a point worthy of note is that all three hospitals reported 20 per cent of aseptic necrosis of the head in cases coming to union, to such a degree that the condition simulated osteoarthritis with flattening and mushrooming and with symptoms so acute that in most cases arthrodesis of the joint was necessitated. Therefore, even when union is effected, the question is still unsettled as to whether the blood supply to the capital fragment is sufficient to prevent aseptic necrosis.

In 1902 Murphy first published statistics concerning the use of his metal nail as a fixation agent. It was a good, well machined square nail and superior to some varieties of recent origin. Since I began practice in 1904 many patients have come to me for treatment of nonunion after this and other types of nails had been used. Eventually this nail went completely out of use and was practically forgotten, until twenty-five years later, when an avalanche of nails, bolts, needles and screws of multitudinous variety appeared. Recorded experiences such as these and many others have resulted in much discussion of this subject in medical and surgical circles.

It would indeed be difficult today to catalogue all the types of treatment recommended for fractures of the hip. In general, they may be classified under two headings: the conservative, or nonoperative, and the operative. In the former category one may mention the names of Whitman, Leadbetter and Maxwell Ruth among others. The latter category can again be divided according to the different applications of metal gadgets used for internal fixations. One of these, recently announced by Dr. Morrison, is extremely clever and ingenious. It consists of a bolt or big nail with an internal contrivance inside that leads to the head of the bolt; after insertion into the head of the femur the extreme end of the bolt can be opened like a small

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Read before the American Association of Railway Surgeons, Chicago, Sept. 22, 1937.

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umbrella, thus insuring firm fixation into this fragment; the fragments are then firmly approximated by twisting the screw at the proximal end of the bolt.

The crux of the situation is that members of the profession have failed to recognize the fact that a subcapital fracture of the hip is a different problem from that of other fractures and, in failing to recognize this, they have assumed that mere reduction and maintenance of the fragments in position were all that was required. For nearly twenty years I [1] have contended that this was not all but that there were other factors entering into this particular fracture problem. A study reveals an unusual situation, the importance of which, strange to say, has never been appreciated, considering that success or failure of treatment depends on the recognition and overcoming of the difficulties disclosed. The capsule of the hip joint is attached to the neck of the femur obliquely and close to the base of the neck, and therefore a subcapital or central fracture of the neck of the femur is completely intra-articular. If it is completely intra-articular, then all possible sources of blood supply coming to the fragment of the head from the trochanter region of the femur or distal to the joint are cut off. This being so, the ligamentum teres can be the only remaining source of blood supply. The question then arises as to whether the ligamentum teres does in all instances, when not torn, provide an adequate source of blood supply. Wolcott and others have attempted to evaluate this by injecting the blood vessels of the ligamentum teres with mercury in cadaver specimens. This research has proved extremely interesting. In 15 per cent of cases Wolcott could not find blood vessels in the ligamentum teres of sufficient size to allow mercury to flow through them into the head or neck of the femur, and Henderson claims as high as from 20 to 25 per cent. So much for this.

The next question to be considered is the possibility of the ligamentum teres or its blood vessels having been destroyed by the trauma producing the primary fracture, and in this regard there are some very important observations not to be overlooked.

During the past twenty-five years I have performed 413 reconstruction operations for nonunion with marked absorption of the femoral neck and have in each case removed the head of the femur. Some of these were during the period of my service in the Great War. A careful check was always made by myself and my associates of the condition of the ligamentum teres at the time of the operation, and it may seem surprising that in 411 of these cases we found not the slightest evidence of bleeding at the cotyloid notch where the ligamentum teres is inserted into the acetabulum, which would have occurred if the ligament had been evulsed or torn at operation. In more than 70 per cent of cases, all ligamentous tissue appeared to have been evulsed from the cotyloid notch; in the remaining cases tabs of ligamentous tissue were found attached to the cotyloid notch of the acetabulum and fovea of the head of the femur or both. In two cases the ligamentum teres was found intact. In one of these the fracture was found to be at the center of the neck and due to a rifle bullet which was discovered at operation between the ununited fragments. The thought occurred to me that, since the neck of the femur was severed by a bullet, it might at the time have produced shock with its resultant muscle flaccidity. Therefore the muscle spasm incident to the usual fracture did not occur and force the distal fragment of the femur upward, thus rotating the head in the acetabulum upward on the outside and the fovea of the head downward on the inside, to such a degree as to tear or evulse the ligamentum teres (fig. 1). This assumption is strengthened by the fact that the capsule is loose and alone determines the extremes of motion of the joint when the bony framework of the joint is intact.

It is believed that the rotation of the head which tears the ligamentum teres is brought about by the concerted spasmodic contraction of two powerful groups of muscles at the time of fracture. While the inward and outward rotators of the hip pull mesially on their osseous insertion (the great trochanter), holding the fracture surfaces of both capital and distal fracture fragments together, like the cogs of cog-wheels, at the same time the more powerful muscles force the distal fragment upward, rotating the fracture end of the spherical capital fragment upward and the fovea side of this head fragment downward, in this way tearing or evulsing the ligamentum teres.

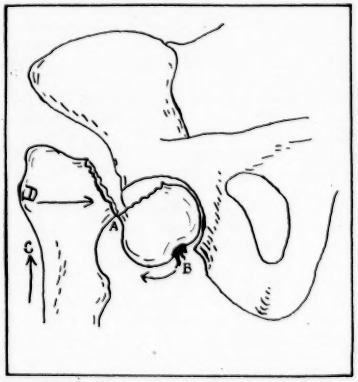

Fig. 1.—Diagram showing direction of forces which produce rotation of capital fragment with resultant rupture or shearing of the ligamentum teres. Arrow at *C* indicates femur forced upward by trauma or muscle spasm, or both. Arrow at *B* indicates direction of rotation of head by the displacement upward of the femur because of contact of fragments at *A*, which is brought about by spasmodic pull of inward and outward rotator muscles on the trochanter in the mesial direction, as indicated by arrow *D*.

The anatomist Frederick Henry Gerrish [2] makes the following statement:

The ligamentum teres (round ligament) is not round, but a triangular, flat interarticular band attached by its apex to the upper half of the depression on the head of the femur, and by its base to the transverse ligament and the margins of the cotyloid notch, the ischial portion being the stronger. It is surrounded by synovial membrane, and represents a migrated portion of the pectineus muscle. It conveys a small branch of the obturator artery to the head of the femur. It is torn in dislocation of the femur. . . .

The ligamentum teres is put on the stretch in flexion with abduction or outward rotation, or both, but it is too weak to be of use in resisting these movements or in strengthening the joint.

Dr. Henry Gray [3] writes as follows:

The ligamentum teres femoris is a triangular, somewhat flattened band implanted by its apex into the anterosuperior part of the fovea capitis femoris; its base is attached by two

1. Albee, F. H.: Orthopedic and Reconstruction Surgery, Philadelphia, W. B. Saunders Company, 1919.

2. Gerrish, F. H.: A Textbook of Anatomy, Philadelphia, Lea Brothers & Co., 1899, p. 232.

3. Gray, Henry: Anatomy of the Human Body, Philadelphia, Lea & Febiger, 1924, p. 338.

bands, one into either side of the acetabular notch and between these bony attachments it blends with the transverse ligament. It is ensheathed by the synovial membrane, and varies greatly in strength in different subjects; occasionally only the synovial fold exists, and in rare cases even this is absent.

Still another authority, Dr. Gwilym G. Davis,[4] may be quoted in this connection:

The ligamentum teres is composed of synovial and connective tissue. It is not strong and ruptures at about 14 kilos (30 pounds); the small artery it contains affords nourishment for itself alone, only a very small amount of blood going to the head of the femur. Bland Sutton regards it as a vestigial structure and a regression of the pectineus muscle. It is too weak to add much to the strength of the joint, and the view of Allis that its function is to distribute the synovial fluid and act as a lubricating agent is probably correct. The great pressure to which the articular surfaces of the hip joint are subjected requires special lubrication and this is furnished by the ligamentum teres and haversian gland.

From these studies, it is deduced that in the 411 cases of subcapital fracture the weak ligamentum teres

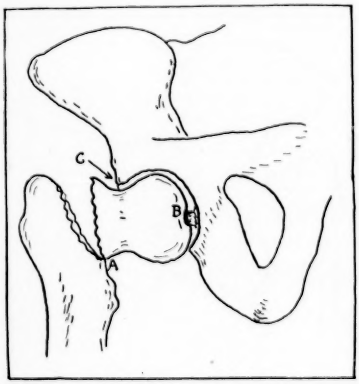

Fig. 2.—Diagram to show contrast with conditions in figure 1. In this instance, in which the fracture is at the base of the neck, rotation of the capital fragment to the degree of destruction of the ligamentum teres is prevented by the impingement of the outer portion of the neck of the femur at C against the rim of the acetabulum.

was destroyed by torsion or rotation incident to the explosive displacement at the time of fracture. The extreme force either evulsed the ligamentum teres from the acetabulum or head of the femur (more frequently it is the former) or ruptured the ligament by a twisting or shearing motion. After many months, or, as is often the case, many years, it is difficult to deduce accurately the circumstances associated with the destruction of the ligamentum teres. Varying degrees of fibrous adhesions to the periphery of the head are sometimes found, but, when severed in removal of the head, they have never been found to bleed to any appreciable extent, thus indicating that they have not been a source of blood supply to the capital fragment.

If this ligament has not been ruptured, there is every reason to believe that its continuity would serve to conduct induced collateral circulation to the capital fragment, even if anatomically the blood vessels were very meager in it.

It is my firm belief that in those cases coming to nonunion the destruction of the ligamentum teres at the time of the fracture is the determining factor in the prevention of union. In other words, one is justified in coming to the conclusion that, when the ligamentum teres is destroyed, under such conditions the capital fragment becomes practically a joint mouse. Because of the intervening joint cavity, no blood supply can come to it, as in other fractures from adherent overlying muscles or soft parts. The fracture is wholly within the hip joint with very little soft tissue at the point of the fracture other than the torn synovial membrane on the neck itself.

A case bearing on this problem is under my observation at the present time:

The patient sustained at different times fracture of each hip. At the time of the first fracture, that of the right hip, there was no treatment at all. The patient lay in bed for a while and the hip united satisfactorily. Four years later the patient suffered a fracture of the left hip. It was treated and put in a Whitman spica cast by a competent surgeon, and roentgenograms taken at the time indicated excellent apposition of the fracture fragments. Nonunion followed, and fourteen months after the time of fracture the patient was seen by me and a reconstruction operation was performed. The capital fragment was removed, a wedge being made of it to reconstruct the lever at the top of the femur. On removal of the head it was found that the ligamentum teres had been destroyed.

The point to be emphasized in this case is that when the right hip was fractured the ligamentum teres probably was not destroyed and therefore union took place. When the left hip was fractured the ligamentum teres was probably torn, thus causing the blood supply to be cut off from the capital fragment and so, in spite of efficient Whitman treatment and immobilization, the fracture did not unite.

It can be further deduced that it is only in central or subcapital fracture that the mechanics is such that the capital fragment is permitted to rotate under the superior edge or roof of the acetabulum. When primary impaction occurs, there naturally cannot be extreme rotation or twisting of the head; therefore the ligamentum teres does not become torn or evulsed. This undoubtedly is one of the principal reasons, if not the determining reason, why such fractures are much more favorable to union. By the same token, it does not follow that secondary artificial impaction by the surgeon is of the same value because rupture of the ligamentum teres may already have taken place. When the fracture occurs farther out in the neck of the femur, especially when it is transtrochanteric, the fragment is so long that it cannot become rotated or twisted under the rim of the acetabulum (fig. 2); therefore the ligamentum teres does not suffer. Also if the fracture is so far out that it is partly or completely extra-articular, the adherent soft parts to the distal end of the capital fragment will prevent its rotation or torsion to such a degree as to rupture the ligamentum teres and also serve to convey blood vessels to the fracture junction of both fragments. There is thus a double reason for the tremendously increased difference in the percentage of union of such fractures as compared with the subcapital variety.

Realizing these facts, I worked out the use of the bone-graft peg in the treatment of ununited fractures and some years ago published statistics showing about 94 per cent successful results. About the same time Dr. Willis C. Campbell, using the same method, published statistics that were even better than mine. The significance of these results is extremely important, since Dr. Campbell and I were dealing with cases much more unfavorable than fresh fractures, first,

4. Davis, G. G.: Applied Anatomy, Philadelphia, J. B. Lippincott Company, 1913, p. 507

because they were nonunions, or pseudo-arthroses; second, because the capital fragment had become practically a joint mouse, and, third, because the urge of primary repair had long ceased to exist.

It is further interesting to note that, through a fault in technic on my part in failing to approximate the fragments in three of these cases, we learned something of great significance concerning the function of the autogenous bone-graft peg. (When inserting the peg, I always attempt to impact the fragments.) In these cases the hiatus between the fragments (varying in extent from one-half to two-thirds inch) was spanned within the joint by the bone-peg alone. X-ray study of these cases at a later postoperative date showed that the peg constantly increased in size to the degree that it finally filled in the hiatus completely and that, in spite of the fact that the fragments were separated and the peg was situated in the joint cavity, blood vessels extended through it from the trochanter fragment to the capital fragment, the peg by its inherent osteogenesis having filled this space between the fragments with resultant union. The importance of this observation is self evident as showing the potentiality of the bone-graft under most unfavorable conditions. It is interesting to consider what would have happened had a metal agent been used. In this respect, however, it should be commented that in many instances I have observed that a graft has filled in spaces many times more extensive than in the cases cited—even to as much as sixteen times the dimension of the hiatus in any one of the cases, the only difference being that the long grafts were surrounded by soft tissue instead of spanning a joint space.

About four years ago Scudder, who is an authority on fractures, realized the importance of this question of blood supply in fractures of the neck of the femur and, in discussing a paper by Dr. Moorhead, suggested that the capsule be incised and the muscle tissue brought through the rent in the capsule into the hip joint, thus being brought in contact with a freshened surface of the capital fragment in order to bring blood supply to this fragment. This suggestion, to fill a part of the joint space with muscle by contact with the freshened areas, in the hope of bringing blood supply to the anemic head, does not seem very feasible. One approaches this suggestion with skepticism for the very pertinent reason that muscle tissue, even when temporarily cut off from the blood supply, changes to connective tissue, as is so well demonstrated in Volkmann's ischemic palsy. In fact, during the last twenty years I have seen several cases in which muscle tissue has proved to be the most unfavorable of all tissues to withstand temporary or prolonged loss of blood supply. In this connection one could cite cases of emboli, thrombosis and accidental severance of an artery; also extreme cases of interruption of blood supply from fractures such as at the elbow, where, instead of Volkmann's palsy with muscles turning into connective tissue, they merely sloughed. In all these cases the muscles were pulled out through the skin, which, as well as the bone and other structures of the extremity, had retained its vitality. The blood supply would indeed have a better chance of being reestablished after temporary anemia had been relieved in the muscles of the forearm than would be the case if a piece of muscle were pulled through a rent in the capsule of the hip.

Bone, being a supportive and relatively undifferentiated tissue, is able to suffer the absence of its blood supply for a considerable time without adverse effects for the reason, among others, that it is extremely favorable for transplantation. The rapid and profuse vascularization of a bone-graft is one of the most striking features encountered. When a portion of the complete diameter of a long skeletal bone has been replaced by massive grafts of much smaller diameter, not only will the whole shaft be restored to its complete diameter and strength but also a completely vascularized marrow cavity will develop. The same phenomenon occurs in the use of a bone-graft as a terminal structure, such as in building digits, in which a tibial bone-graft is inserted into a tubular skin graft to restore a finger or thumb, which I have done many times. In this instance there is a physiobiologic demand for blood at the distal end of this bone-graft and in response a collateral circulation is developed in the whole length of the graft to the degree of a marrow cavity with its incident blood vessels. The analogy is identical to that of the peg graft conveying blood to the anemic femoral head from the very vascular cancellous tissue of the trochanter. These characteristics, as well as the osteogenic capacity of the autogenous bone-graft peg together with its mechanical strength (for immobilization purposes) determines it to be the ideal means of treatment in operable cases of both fresh and ununited fractures of the central intra-articular portion of the neck of the femur. It is the only answer to the tripod of necessity in the treatment of such fractures, for it first furnishes immobilization and, second, a living scaffold for vascularization to the anemic head fragment, and, third, it brings an osteogenic, callus-forming material to the fracture junction.

Sir Arthur Keith, the practical pathologist of England, has prepared an extensive number of specimens that are on exhibition in the Museum of the Royal College of Surgeons in London. The study of these specimens is most profitable. They are prepared and injected to show the profuse vascularization of bone grafts in general. In putting in bone grafts to take the place of portions of shafts of bone, my own experience has in many instances confirmed Sir Arthur's observations. These cases, which have been studied over a period of years, both by x-ray and by laboratory means, have demonstrated profuse vascularization and even the formation of a marrow cavity.

After most operations the period of immobilization in double plaster of paris spica casts is twelve weeks. The callus-forming capacity of the bone during that time is so low that one must allow a generous period of time for this to take place. Whether the bone-graft peg operation should be performed as the primary treatment is for the surgeon and his patient to decide. Some patients, of their own volition, have requested the operation.

To recapitulate, it is of great importance with every type of treatment, especially when any of the various kinds of metal fixation agents have been used, for the surgeon to be eternally vigilant in watching for the earliest evidence of the beginning of nonunion. If there should be any change of position in the relation of fragment to fragment, even of the slightest degree, this is evidence that union is not taking place. Very soon proof will follow with bone absorption at the neck of the junction of the fracture, indicating that there is an inadequate or total lack of blood supply and also that the ligamentum teres may have been ruptured or destroyed by a twist or rotation of the head at the time of fracture. In the latter event the capital frag-

ment is essentially a joint mouse. Under such conditions, if union is to be secured, immediate action is urgent. With the fragments in good position, a bone-graft peg of at least one-half inch diameter should be obtained, preferably from the crest of the tibia, and should be immediately inserted.

PSYCHOSIS AND THE CENTRAL AUTONOMIC NERVOUS SYSTEM

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In the study of patients with so-called mental diseases it has been perhaps inevitable, because of its prominence and overt expression, that primary emphasis should have been accorded to the form, or content, of the psychosis as a means of differentiating nosologic entities. Much admirable research into physiologic disturbances occurring as symptoms in mental illnesses has, however, rendered little service to their elucidation, mainly for the reason that the correlations which have been attempted are between the symptoms of the illness, on the one hand, and the person who is ill, on the other. It is my purpose in this article to present considerations for a reorientation of point of view, not with the object at present of propounding a new system of classification, for which there is yet insufficient knowledge, but as a guide to the analysis of clinical material and the prosecution of research.

It will probably be conceded without question that what underlies mental illness is some disturbance, due either to structural lesion or to situational stress, in the central integrating mechanisms of the organism.

DISTINCTION BETWEEN ILLNESS AND PERSON WHO IS ILL

In analyzing any case of mental illness clinically, there are two groups of factors to be considered: (1) the nature and location of the illness, and (2) the personality of the person who is ill. A structural lesion of the nervous system gives rise to symptoms which depend on the location of the lesion; these are necessarily primary disorders in physiologic activity. The form and character of the adjustments that the patient will make under the conditions of the illness, however, depend on his personality—his persistent habits of adjustment.

To illustrate this statement, reference may be made to disease processes of known character; for example, in dementia paralytica it has long been accepted that the cerebral lesions give rise directly to well recognized disorders of function which depend on interruption of corticospinal cerebral pathways—the various manifestations known as dementia, aphasia, hemiplegia, and so on. Symptoms of this type are present in every case of dementia paralytica and depend for their appearance on the location of the lesions. At the same time there may or may not be present a psychosis, the meaning of which as a descriptive term will be more fully discussed later. At this point all that is necessary to indicate is that the "form" of the psychosis does not depend on the nature of the illness but is derived from the personality of the person who is ill. The "form" of psychosis, when one occurs, may be an anxious depression, a manic excitement, a schizophrenic syndrome or a paranoid state. To correlate the various physiologic disturbances revealed as dementia, for example, due to the cerebral syphilis with the "form" of the psychosis will generally be conceded to be impossible. And yet this type of correlation is adopted in what are commonly called the "functional" psychoses—those in which at present the lesions, when they exist, have not been defined or discovered.

Reasoning by analogy, it seems permissible to conclude that in all psychoses, just as in those which accompany such structural lesions as those of dementia paralytica, cerebral arteriosclerosis or toxic delirium, the form of the psychosis, no matter what the nature of the illness, depends on the personality of the person who is ill.

The criteria to be used for a pathologic diagnosis, on the other hand, as in dementia paralytica, are the modifications in function caused by the lesion. This means that in order to diagnose the presence, nature and location of a lesion in any case of mental illness one must search for evidence of what functions are damaged or are lost and what remain intact, regardless of the particular pattern of expression usual to the patient—that is to say, whether an existing psychosis is of the manic-depressive, schizophrenic or paranoid form. If there is a structural lesion, the symptoms of altered function are essential or primary and will always be present, like the dementia in dementia paralytica; they should be particularly well defined and indicative of location in the final stages of the illness in cases in which permanent damage occurs.

THE MECHANISMS OF INTEGRATION

The central integrating mechanisms of the body are commonly grouped for convenience under two main headings: the cerebral pathways (corticospinal) concerned in symbolic representation, and those commonly described as autonomic. As regards the afferent paths of these two systems, the former come especially from the more highly discriminative organs of special sense and the latter from organs concerned in vegetative and primitive defensive reactions. Each system has its own set of efferent pathways and effector organs. There are also cerebral association pathways connecting the two in both directions. Using commonly accepted psychologic terms to describe the two systems, it is permissible to speak of the first as dealing with "intelligent" and the second with "affective" types of response.

The manifestations of damage in the central corticospinal integrative mechanisms have been comparatively well defined. Expressed briefly, they include disturbances in the reactions associated with consciousness and are evinced in the forms of illusion, dementia, disorientation and defects in action of the type of apraxia. In addition to the ordinary methods of neurologic investigation of lower level disturbances of function in this system there are available various "tests" for higher level disturbances in apperception and intelligence tests of various kinds. Such tests are continually being improved and refined and are fairly reliable, though complicated in interpretation by such problems as attention and distraction. They reveal evidences of dysfunction in most cases of recognized disease processes within the corticospinal system, and one does not hesitate clinically to postulate from the symptoms observed the presence of lesions and their location even when one does not know their nature.

Numerous researches with these methods of "testing" have been carried out in cases of "functional" psychoses. While there are some not fully explained exceptions, it seems justifiable to assert that almost always they have yielded negative results. Hence it may be concluded

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that damage in the corticospinal system is at least not a principal feature of these forms of illness.

The foregoing statement applies not only to the manic-depressive psychoses but also to those of schizophrenic or paranoid type. Kraepelin,[1] who adhered rigidly to facts of observation, stated that dementia praecox is "a peculiar disturbance of the inner coherence of the psychic personality with outstanding damage in the realm of mood and in volition." Furthermore, in describing the terminal states of deterioration which frequently occur, he said ". . . the clinical picture is dominated sometimes more by poverty of ideas, sometimes more by emotional dulness and sometimes more by some one of the peculiar disturbances of volition." These statements both express the conclusion that there is essentially a disturbance in energy and the affective life. A similar description could be given of the terminal state in other psychoses; for example, in the deterioration observed after presenile psychoses (spätkatatonie) and after frontal lobectomy. These considerations at once suggest that the essential structural damage in the "functional" psychoses, including dementia praecox, when present, lies not in the "intelligence" or corticospinal regions of the brain but in the central autonomic or "affective" integrating machinery. Study of the life histories of many, but by no means all, patients with dementia praecox and of the manifestations of the illness, especially in its terminal stages, points in the same direction. Most of the research in dementia praecox today is directed toward the study of autonomic functions. This feature has been emphasized by many investigators, and yet there seems to be an unwillingness to carry the observations to a logical conclusion. So much attention has been focused on the "schizophrenia" (a term which I understand as meaning the form of the psychosis) that the significance of the "dementia praecox" (a term that may well be used to express a pathologic lesion) is overlooked.

It should be stressed that the point of view here outlined does not apply alone to schizophrenia, even though I have used illness manifesting itself in this form for purposes of illustration. One reason for making this selection is that the schizophrenic form of psychosis presents such striking evidences of distortion of thinking and action that one is almost inevitably led to postulate change in the central corticospinal neurons. It is my principal contention that it is the fact of psychosis alone that is determined by the pathologic lesion, and that the form or content of the psychosis is determined by the personality of the patient. It is not without significance that in the discussion of cases there is frequently a diversity of opinion as to whether a psychosis is of manic-depressive or of schizophrenic form; combinations of these two forms, often with more or less admixture of paranoid features, are so common as to be almost the rule. It may be suggested that a similar difficulty is experienced in attempting to classify people by personality as syntonic or cyclothymic, on the one hand, and schizoid on the other. It is always a problem not of all or none but of more or less. If I am correct in stating that one form of lesion may give rise to a schizophrenic psychosis in one person and to a manic-depressive psychosis in another, such differentiations have little importance medically. This is not intended to imply that study of the form of psychosis should be neglected. Indeed, a psychosis, outcome of an experiment of nature, presents the facts of modes of adjustment in such exaggerated form that it furnishes extremely valuable information for use in the study of personality and the psychoneuroses.

The foregoing considerations lead me to the conclusion that the presence of a psychosis always indicates disturbance in central autonomic integration, no matter what the pathologic nature of the cause. It may be unnecessary but seems wise to emphasize that the corticospinal and the autonomic systems may both be damaged by some lesions. When this occurs, as in dementia paralytica, for example, there will be symptoms belonging to disturbed functions in both systems.

PSYCHOSIS AND PSYCHONEUROSIS

While it has little bearing on the thesis of this article, it seems advisable to comment on the current use of the terms psychosis and psychoneurosis. I know of no satisfactory definition of or means of distinction between these two terms, and one encounters even such statements as that psychoneuroses are "minor psychoses." This lack of clarity in the use of these terms is an unquestionable source of confusion. In order to overcome this difficulty, I propose to define these two terms as follows: A psychosis is a pathologic state of mind brought about by structural lesion of the central autonomic nervous system; a psychoneurosis, on the other hand, is a disturbance in adjustment to the problems of life, no matter how severe. The former arises from causes within the organism of a structural nature; the latter arises primarily from extra-organismal or interorganismal relations, and the liability to its occurrence is dependent on the constitutional endowment of the patient at the time.

It is not my intention to make an issue of this question of defining terms, but I submit that the meaning here offered has a practical bearing on the understanding of mental illnesses and the selection of the appropriate therapeutic approach. Used in this manner, the term psychosis is not a substitute for the legal term insanity (a sense in which it is often used) but implies the presence of an organic lesion even if the nature of the lesion is not known. Furthermore, a psychoneurosis may be so severe that the patient is committably "insane."

From these considerations it is evident that a new grouping of mental illnesses must be undertaken. With the psychoneuroses would be included the conventionally accepted reactive depressions and elations, and cases of what today are called schizophrenia but which are essentially reactive conditions of psychogenic nature.

AUTONOMIC INTEGRATION AS CONSTITUTIONAL ENDOWMENT

In the evaluation of constitutional endowment, too little consideration has been given to the problem of energy endowment. The energy of the organism undoubtedly arises ultimately from the metabolic activity of the individual cells of which the organism is constructed. Regulation of the metabolic activity, and hence of the quantitative output and direction of flow of energy, is a function of the autonomic system, in which are included the endocrine glands, and this is integrated through the central autonomic nervous system.

While satisfactory means for the accurate measurement of energy capacity are not available, it is possible to estimate this factor by a study of the life history of the patient through forcefulness of active adjustment

1. Kraepelin, Emil: Psychiatrie, Leipzig, Johann Ambrosius Barth, 1913, vol. 3, p. 668: ". . . eine eigenartige Zerstörung des inneren Zusammenhanges des psychischen Persönlichkeit mit vorwiegender Schädigung des Gemütslebens und des Willens." P. 880: ". . . in denen bald mehr die Verstandesschwäche, bald mehr die Gemütsstumpfheit, bald mehr eine der eigenthümlichen Willenstörungen das Zustandbild beherrscht."

or a tendency to retire into wishful thinking, the reactions of the body to toxins and infections and the types of associates and of vocation and avocation, for example. The energy of the organism does not correlate with intelligence. Energy may be severely defective in a person with superior intelligence quotient; the reverse is also observed. Doubtless in this, as in other bodily functions, there is a range of what may be considered normal energy (in the sense that the energy is sufficient to allow adjustment to average life difficulties). Even with average energy endowment, however, greater thwarting from particularly difficult situations may still give rise to poor adjustments, or psychoneuroses.

PATHOGENIC POSSIBILITIES

1. *Organic (Psychosis).*—Like other organs and systems of organs, the nervous system is liable to such lesions as toxic and infectious damage, trauma, neoplasms, degenerations due to defective blood supply, senility, dietary deficiency and other causes. When such lesions involve the central autonomic nervous system a psychosis—characterized by increase or diminution in the output of energy—will occur.

The Nature of Disturbance in the Central Autonomic Nervous System in Relation to the Conventional Classification of Mental Illness, Mainly on the Basis of the Personality of the Patient

The Illness	Some Conventional Designations
Primary defect conditions..	Dementia simplex type of schizophrenia; psychopathic personality; some neurasthenias
Toxic and infectious lesions	Delirious psychoses; acute hallucinosis; manic-depressive, schizophrenic and paranoid psychoses and emotional deterioration following epidemic encephalitis, or associated with pellagra, dementia paralytica, and the like
Traumatic lesions.....	Psychoses associated with trauma of the head; the traumatic constitution
Degenerative lesions.....	Psychoses and affective defects with involutional melancholia and other presenile conditions, with senility, with arteriosclerosis, and so on
Lesions of unknown nature	Many schizophrenias, particularly those of catatonic form; some manic-depressive and paranoid conditions
Disorders in homeostasis...	Constitutional types of manic-depressive psychosis and some schizophrenias of cyclic form
Situational reactions (without structural lesion)	Most psychoneuroses; some manic-depressive, schizophrenic and paranoid psychoses

A particular group of psychoses, sometimes of manic-depressive, sometimes of schizophrenic, form appears to be associated with defective organization of the integration of what Cannon has called homeostasis. Since these are periodic in their appearance it seems at least probable that there are precipitating factors of unknown but possibly sometimes of organic nature which do not give rise to irreversible changes in the nervous system.

2. *Primary Defects.*—Ageneses and defects caused by lesions occurring early in life are well known in the cerebral corticospinal system and are known clinically as mental deficiency. It is postulated that similar defects occur in the central autonomic nervous system. These are expressed in the form of defective energy of reaction, low levels of metabolic activity, and so on, and have already been discussed under the heading of constitutional endowment.

3. *Reactive (Psychoneurosis).*—As already indicated, these are adjustments of the organism to situations of difficulty and thwarting. However, as an essential part of the causation there is a relative weakness of autonomic construction, relative in the sense of a relation between the energy available and the severity of the difficulty giving rise to the adjustment.

While psychoses and psychoneuroses are thus defined as presenting essential points of difference, it must not be inferred that they are mutually exclusive. Combinations of the two types of factor are common in clinical experience, and careful analysis may be needed to evaluate the importance of each and thus to determine the proper therapeutic approach.

The accompanying table will indicate, in a general way, the regrouping of cases that emerges from the foregoing considerations. Damage in the corticospinal integrative mechanisms has been omitted from the table for the reason that the symptoms produced are commonly recognized and adequately evaluated. It should be stressed, however, that one and the same disease process may affect the two integrating systems, as in dementia paralytica, toxic delirium or cerebral arteriosclerosis. A psychosis may thus be accompanied by evidences of disturbance of intelligence.

From the table it is evident that, when analyzed in this way, it has seemed possible to make some tentative subdivisions of the pathologically heterogeneous groups of the so-called functional psychoses. In illustration, the case histories in two examples of what were conventionally classified as schizophrenia are outlined and the differential points emphasized. One is a psychosis, the other a psychoneurosis as here defined.

Case 1.—*Conventionally classified as schizophrenia with some catatonic features. Principal symptoms, disturbances of mood with progressive deterioration of interest and activity in a person with good intelligence and low average energy endowment. Diagnosis: structural lesion, nature unknown, in the central autonomic nervous system; schizophrenic psychosis.*

Prepsychotic History.—The family history was without especial taint, except that an older brother died of tuberculosis at the age of 25. The family was an unusually closely knit unit, apparently content to make few external associations. The early history of the patient is remarkable for lack of color in the personality. She was always healthy and had no serious illness. She was obedient and did not get into mischief, never requiring discipline; she was retiring and made few friends, prudish in dress and habits, did not smoke, drink or use cosmetics, and yet was not unusually religious. She was bashful with men and had no love affairs. She was thoughtful of others and meticulous in her work. After leaving school at the age of 17 she secured a position as a stenographer and remained with this firm for thirteen and one-half years until the time of the breakdown; she was promoted to the post of secretary to an executive officer, her maximum earnings being $125 a month; she voluntarily gave her earnings to the mother.

The lack of forcefulness and expression of inner drives suggest that endowment with energy was somewhat below average, but adequate for the situation in which she lived and sufficient to enable her to pass through the period of adolescence without evident difficulty. The absence of severe illness indicates an adequate bodily defensive endowment.

Endowment with intelligence was certainly average and probably higher. She graduated from grammar school at the age of 12 years 2 months, having received double promotion from grade 6B to grade 7B. In high school she was considered one of the bright students of her year. Her only extracurricular activity in high school was working on the school paper; she had some stories printed. She always returned home promptly from school and worked in the family store. An intelligence test (Stanford-Binet) at the age of 31, three or four years after the onset of the illness, gave an intelligence quotient of 102, and the comment was made that this was probably at least 10 points too low.

Precipitating Factors.—Careful inquiry failed to reveal any change in the situation at home, at work or in the personal affairs of the patient.

The Psychosis.—The onset was insidious and the progress slow. Three years elapsed after the first changes were noticed before it was realized that there was something seriously wrong and the patient was sent home from the office. The early manifestations, at the age of about 28, were signs of irritability,

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fatigue and increasing withdrawal from people. These were at first occasional and fleeting but slowly became more frequent and persistent. There also appeared evidences of a feeling of change and a depressed mood, with self blame. For example, she spoke of noticing a change in a younger brother, who had been probably her closest friend, and said that the change was due to poisoning because she had sterilized some instruments in an antiseptic solution when the brother had diphtheria three years before. She began to speak of being observed by people, particularly colored people, on the streets, that her home was under surveillance and her father wanted by government men. At the office she became argumentative, even at times impertinent. Sudden impulsive actions, without apparent motive, were observed both at home and at work. For example, she would suddenly leave the room, walking hurriedly, and be found rocking furiously in a chair or staring through a window, seemingly perplexed and oblivious of her surroundings; on one occasion, three years after the onset, she jumped out of bed in the middle of the night and started to play the piano. When questioned about this episode she said that a voice had ordered her to play and sing; other evidences of hallucinosis were not observed at any time. With these erratic and somewhat explosive disturbances of mood, which became gradually more prominent, there appeared evidences of loss of interest; she became careless of appearances and, though she had been a prude, would wander around the house nude.

The patient was under observation at the Psychiatric Institute for about fifteen months, when her age was 31 and 32. During this period she was most of the time inactive and indifferent, but there were occasional spontaneous spurts of increased activity, in some of which she was even playful and interfered with other patients. Most often she resisted in routine activities, such as eating, bathing and dressing. The resistance was often negativistic; for example, she might do no work in the occupational department but begin to work rapidly when the call to discontinue was made; when asked to do something she might not comply but suddenly perform the task if someone else was asked to do it. At times she assumed awkward postures, such as standing on one foot with the other raised, and maintained this posture for as long as ten minutes. Occasionally she was violent; she threw dishes at a patient who took some bread from her tray. Her voice was most often so low as to be almost a whisper; at other times it was almost a yell. She was negligent and careless in dress and attention to excreta.

Mental content as revealed in what she said and did appeared to be as colorless as the story of her prepsychotic life. She was formally well oriented at all times and the comment was made that her speech utterances were grammatically correct. Memory, as far as could be investigated, was good; she spoke of incidents in another hospital, recalling the names of nurses and physicians. Frequently there were expressions of a feeling of change and domination, with depressive content. She said, for example: "I feel a goner; I don't want to ruin any of your lives; I don't want to hurt any one; there is a change in me; I have no respect, no love; do you think I am dead? Death is coming; I am afraid of death." "I want to come but something keeps me from coming; I can't help it; I want to eat, I'm not really stubborn, but I just feel that something holds me, I can't help it."

Following a period of dauerschlaf from administration of sodium amytal there was a brief period of improvement. The patient became more active and responsive. She said spontaneously that she felt better and asked for the physician by name, saying that she wished to go home. "I feel well enough to go." She assisted the nurse with some ward work and said "May I wash those cups for you? They are greasy and you will get it all over your hands, and it will give me something to do."

Physical examination revealed little of significance. There was severe acne of the face. A roentgenogram of the chest was normal in appearance, in contrast with the fact that about two years later a film made at the Chicago State Hospital presented definite evidence of tuberculosis. Laboratory studies yielded results that were all within normal range. The blood pressure was 124 systolic and 88 diastolic; the basal metabolic rate was +1 and —16, respectively, on two occasions. Studies of the blood pressure and electrical resistance of the skin under various forms of stimulation revealed changes which will not be discussed at this time.

On a number of occasions there were observed some peculiar attacks lasting approximately ten or fifteen minutes. The attack would begin with rapid deep breathing, the eyes being closed, and after a short time would seem to reach a climax with a deep breath, when she moaned and slipped gently to the floor or back in a chair; she then appeared stuporous and limp but was not unconscious. There were no convulsive movements, but a tremor was observed in the entire body and the skin was bathed in perspiration.

On leaving the Psychiatric Institute the patient was transferred to the Chicago State Hospital, where she has been for the past year. Apathy and indifference have continued to increase. Activity is less than before, and as already mentioned there are signs of pulmonary tuberculosis.

The facts outlined seem to point, almost exclusively, in the direction of disturbance in autonomic integration. Studies of corticospinal functions reveal no evidence of damage; intelligence was fully average, with the tests used, even three or four years after the onset. In addition, the unusual occurrence of "attacks" of vegetative character has a similar significance.

The conclusion that the disturbance of autonomic integration is due to a structural lesion is based on: (1) a longitudinal review of the onset and course of the illness, early signs suggesting hyperexcitability in energy of response to situations that were apparently in no way changed, with progressively increasing signs of loss of energy (affective deterioration); (2) the absence of a relation of manifest ideational content with any consistent drive and its thwarting; (3) evidences of withdrawal from reality without indications of corresponding absorption in fantasy.

This case seems to present the evidences of vegetative disturbance in almost pure form; that is, uncomplicated by expressions of symbolic representation which would be expected in a person with more colorful personality and imagination. The case was selected for that reason; evidences of a richer fantasy life add a complicating factor which often renders differential analysis difficult.

Possibly it will be objected that this case is so evidently an example of structural lesion that the consideration of schizophrenia is unjustified. The case, however, is not unusual and it will be found on analysis that examples of this type are numerous. It may be added that this patient had been studied in three different hospitals before coming to the Psychiatric Institute and that in all the case was considered to be one of schizophrenia of catatonic type.

CASE 2.—*Conventional classification, schizophrenia of hebephrenic type. Abrupt onset of adjustment by fantasy with striking symbolic expression in a girl, with good endowment but severely tainted heredity and extremely difficult home situation, following a love affair. Recovery without defect in about two years. Second breakdown after another love affair one year later. Diagnosis: Psychoneurosis.*

Personal History.—The paternal family history is replete with examples of erratic behavior, mental illness and criminality, combined with high intelligence. The father was a drunkard and committed many sexual crimes. The mother, a talented musician, divorced the father and assumed a different name when the patient was about 10 and has since become the mistress of a man whom the patient calls uncle. The patient was healthy and had no serious illness; she is strikingly beautiful and has resented scars left by instruments used in her delivery and also myopia, which has necessitated wearing glasses since the age of 10. Menstruation started at the age of 13 and was accompanied by moodiness and a tendency to solitude; periods of depression and irritability have been frequent during the week preceding menstruation. At school the patient was always first in her class; she graduated from grammar school at 13 and from high school at 17. She was always anxious to succeed,

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took everything seriously and worried greatly over examinations and other situations of responsibility.

As a child she had little association with other children. It is reported that she was devotedly attached to her father but after the separation of the parents, which was accompanied by a good deal of unpleasant notoriety, never spoke of him. Living alone with her mother after this, she was still more isolated; she was somewhat precocious and found it difficult to adjust to children of her age. The first year in a private high school, at the onset of puberty, was very unhappy; she made no friends and took no part in social affairs. She refused to return to this school and was sent to another private school for girls in her second year. There the picture changed completely; she became a leader, was extremely popular and active, and was thoroughly happy. She showed considerable talent in singing and dramatics. In the last year, at the age of 17, she had a mild love affair, which lasted three months, but she behaved quietly and sedately and showed no particular upset when it was broken off.

After graduating she held several clerical jobs for a short time but resented the monotony and spoke of a desire "to be somebody." She "had to be a lady" and "hated mediocrity." She sang over the radio, without pay, for three months but was dropped because she refused to change her style to suit the sponsor. During this period she maintained an active social life, entertaining friends and showing a good deal of independence. She also studied music and dancing. She wrote poetry with some evidence of ability but did not attempt to publish it. At times she expressed ideas of jealousy toward her mother and resented the mother's selection of her (the patient's) clothes; she commented on the mother's attractiveness and accused her of stealing her "beaux."

Precipitating Factors.—At the age of 19 she became infatuated with a music teacher, aged 35, who is said to have talked to her about sexuality and to have discussed homosexuality. She told her mother that she "worshiped this man" and when the mother told her to "keep her feet on the ground" the patient immediately became reticent and would say no more. The teacher had been giving the patient instruction on producing her voice "from the solar plexus."

The Illness.—The onset was abrupt, shortly after the incidents just mentioned. She began to speak in a deep voice and said it was necessary "to talk from the solar plexus" and "to try to use the solar plexus" in order to be clear. On the following day she was unusually quiet and careless of her dress; she went out and stayed away all day and would give no account of where she had been. The next day she refused to eat, did not speak and lay about carelessly. On the next day she lay around in her room nude, assuming a crucified posture for hours; she took out the window screens and opened the windows wide, saying, "You must not shut out God or God's air." She screamed "hysterically" when the mother attempted to expostulate with her. On the following day similar behavior continued; she hung her head out of the window in the rain and spoke of the need to have "God's rain" on her head to cleanse her; she accused the mother: "You condemned me." She was then admitted to the Psychiatric Institute.

When received, she appeared confused and showed evidence of dehydration and intoxication. These symptoms rapidly disappeared under forced feeding and she became active and restless, showing behavior that was unpredictable. Her manner was stilted and affected; sometimes she entered into games and occupational activities; sometimes she was irritable but never violent. Eating was capricious; often she ate in large mouthfuls, licking the dishes with her tongue, mixing the various foods and even stealing from others. She was coquettish, theatrical and flirtatious, often exposing herself in front of men, and professed to fall in love with the physician who had charge of her. She was often brazenly untidy, urinating and defecating on the floor and laughing loudly while doing so. Saliva was allowed to drool over her clothing. In spite of this behavior she was clearly oriented and fully in contact when she responded to questions, and sometimes expressed the thought "I want to be a lady."

Following a course of dauerschlaf with sodium amytal the patient became more communicative. She spoke of intense jealousy of her mother and said: "I took sick to bring her to her senses." "She persuaded me against men." "The air around me was rotten. I had to breathe deeply to catch air in order to live in purity." "I broke down to clear my mother of her sins." "She always wanted me to have older men as friends and never of my own age. After a second course of dauerschlaf even more frank confessions of resentment toward the home situation were given. She commented on the immoral lives of both her father and her mother.

Subsequently she remained well in contact and the odd behavior rapidly subsided. She was allowed to return home at the end of two months. She remained well for two or three weeks; then there reappeared many mannerisms; she refused food and again became untidy and soiling in habits. She was then sent to a private sanatorium, where behavior similar to that already described continued for nearly a year. Much of the time she spoke only in broken English with a French accent—a symbol for her fantasies, as she later acknowledged. She also retained urine and feces—sometimes necessitating catherization—and said that the excreta "belonged to her"; she defecated on paper and carried the excrement about, refusing to surrender it. In some of the remarks she accused her mother of homosexuality and bestiality. At other times she expressed a maternally protective attitude toward the mother. Improvement occurred gradually, with resumption of interest in sports and dancing. The patient appeared to gain full insight into the significance of the symbols she had used in her fantasies.

Subsequent History.—Arrangements were made for the mother and daughter to leave their home and to live separately in another state. Frank discussions were held with both, and there was a decided improvement in their attitude toward each other. The patient made excellent adjustment socially and secured work in which she was interested. Letters were received from both, recording increased happiness and satisfaction. This situation continued for more than a year, when another love affair disturbed the patient's balance. Unfortunately, she received advice from a physician which she interpreted as implying that her troubles would be cured by sexual intercourse. This advice was followed and resulted in another breakdown, from all accounts similar to the previous episode and without indications of deterioration of interest. This condition still exists at the time of the present report.

The report is much condensed and intended to show only the nature of the illness in broad outline. The facts given are sufficient to indicate the conflicts in which the patient lived—conflicts arising from ideals which had been painfully reinforced by the social attitude toward her family and by the teaching of the mother; strong sexual drives, stimulated by observations of the parents and particularly of the mother, and personal experiences in a somewhat bohemian atmosphere. The form of the illness exquisitely symbolizes the existing conflicts, and the outbreak, in both attacks, was precipitated by a situation of emotional stress. Throughout, except for the brief period of dehydration at the outset, the patient has remained clear and in contact with reality; there have been no evidences of corticospinal defect and no suggestions at any time of loss of energy. Even the untidiness with regard to soiling is evidently an active process of fantasy and adjustment and is not suggestive of defect in energy.

SUMMARY AND CONCLUSIONS

The term psychosis may profitably be used to designate active disorder in behavior resulting from structural damage of the central machinery of autonomic integration, specifically dynamic or "energy" disorders.

The term psychoneurosis may, in contrast, be used to designate maladjustments (psychogenic) to life situations and when used in this sense will include some examples of what today are grouped as psychoses; the behavior constituting a psychoneurotic adjustment may require commitment of the patient.

Examples of structural damage or defect, either congenital or acquired, in the central autonomic nervous

system include, as examples, schizophrenic dementia simplex, psychopathic personality, some forms of "neurasthenia," the "organic" psychoses, involutional melancholia, many manifestations of chronic encephalitis, and affective changes following frontal lobectomy. In addition, there belong in this group many of the so-called functional psychoses, whether manic-depressive, schizophrenic or paranoid in form, even though the nature of the lesion is unknown.

There is an essential difference between the symptoms produced by the illness, which includes the fact of psychosis, and those which express the form of the psychosis. The former are determined by the nature and location of structural damage and the latter by the personality of the person who is ill. Thus, one and the same organic lesion, even though its nature may be unknown, may give rise to a manic-depressive form of psychosis in one person and to a schizophrenic or paranoid psychosis in another.

The use of the form of psychosis as a basis of correlation with observed physiologic disturbances will yield little of value as regards the pathologic condition concerned in giving rise to the fact of psychosis. The form of the psychosis is of paramount value in the study of personality.

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SEVERE REACTIONS FOLLOWING TRANSFUSION IN HEMOLYTIC JAUNDICE

REPORT OF TWO CASES

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OMAHA

During a recent study of a group of patients with hemolytic jaundice before, during and after splenectomy, we[1] have been disturbed on two occasions because of unfavorable reactions following transfusion of whole blood. A general review of the voluminous literature on hemolytic jaundice failed to reveal a single title referable to this complication, but submerged in the detailed study of case reports there are warnings of its occurrence and possibility. As a result of our experience, it seemed feasible to focus attention on the subject and to present the clinical manifestations and the possible cause.

REPORT OF CASES

Miss M. B., a housemaid, aged 25, entered the University Hospital for the third time Nov. 30, 1936, with symptoms of a severe crisis of hemolytic jaundice. On the two previous hospital admissions, four years before, she had been in similar crises with a red blood cell count of about one million. Symptoms of increasing weakness, yellowish pallor and bouts of diarrhea had been present for two months.

On physical examination the patient was extremely pale and moderately jaundiced. The temperature was 101.6 F., the pulse rate 120, the blood pressure 108 systolic and 62 diastolic. There were no purpuric manifestations on the skin, and the flicking test was negative. There was no glossitis or papillary atrophy of the tongue. Generalized lymphadenopathy was absent. There were no pulmonary abnormalities, and except for a soft systolic murmur at the apex, hemic in origin, the heart was normal. The liver edge was just palpable; the spleen was enlarged 4 cm. below the left costal margin. The neurologic examination was negative.

At the time of admission the hemoglobin content was 20 per cent (2.9 Gm.), the erythrocyte count 990,000 and the leukocyte count 4,000. Except for a shift to the left of the polymorphonuclear series, the differential count was normal. A study of the blood smear showed extreme variation in the size and shape of the red cells with numerous polychromatophilic cells, Cabot rings and Howell-Jolly bodies. The mean corpuscular volume of the erythrocytes was 103 cubic microns; the mean corpuscular hemoglobin content was 36 micromicrograms. The bleeding, clotting and clot retraction times were normal, the platelets slightly reduced. The reticulocytes were 5.5 per cent. The fragility test of the red cells showed beginning hemolysis at 0.46 per cent and complete hemolysis at 0.28 per cent. The icterus index was 27 units, the van den Bergh reaction indirect, quantitatively 2 mg. per liter. There was complete absence of free hydrochloric acid in the gastric contents, and examination of the stool was negative for blood. The urine was normal and the Wassermann reaction of the blood was negative. A biopsy of the bone marrow showed marked hyperplasia of the erythropoietic tissue.

The patient was critically ill. Emergency splenectomy was considered, but transfusions were elected in view of the extremely low blood counts and the poor operative risk. A transfusion of 450 cc. of whole blood by the indirect citrate method was given on each of two successive days. Though there was no immediate febrile reaction following transfusion, a few hours after the second one the patient complained of severe abdominal pain. The jaundice became more intense and the spleen became tender and increased in size. The temperature gradually rose to 105.4 F. During the next twenty-four hours the erythrocyte count dropped from 1,700,000 to 1,360,000 and the hemoglobin content from 36 per cent to 25 per cent (chart 1). The donor-

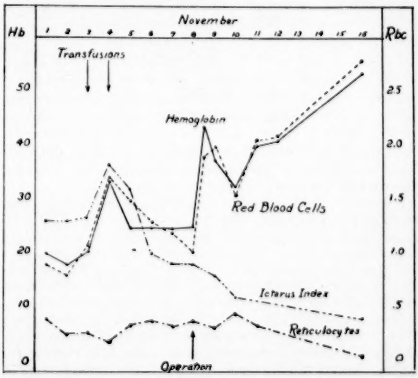

Chart 1.—Course in case 1.

recipient bloods were rematched and found to be compatible. The patient was watched carefully for signs of renal damage, but no anuria, hematuria or hemoglobinuria developed. Four days later splenectomy was performed under gas-ether anesthesia with prompt improvement in the blood and progressive decrease of the jaundice. Two months later the gallbladder was removed because of cholelithiasis. The patient was discharged from the hospital in a greatly improved state, both clinically and hematologically.

E. M., a white man aged 61, a laborer, entered the University Hospital for the first time May 7, 1937, complaining of intermittent weakness since 1932. For several months during each of the past five years he had been forced to stop work because of fatigue. About eight months before admission to the hospital

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1. Sharpe, J. C.: Hemolytic Jaundice, Internat. Clin. 2: 146-167 (June) 1937.

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a diagnosis of pernicious anemia had been made elsewhere and oral and intramuscular liver extract had been administered. Though considerable improvement was first noted, a severe relapse soon occurred while he was still under intensive liver therapy. Symptoms of marked weakness, dyspnea and palpitation on exertion, dizziness and a lemon-yellow pallor had all been slowly progressive in spite of all types of antianemic therapy. He stated that he had had no symptoms of sore tongue, paresthesia or gastrointestinal complaint. The past and family histories were noncontributory except to note that a brother had been jaundiced for some time at the age of 20 years.

On physical examination the patient appeared well nourished. The temperature and pulse and respiration rates were normal. There was a definite icteric tinge of the skin and sclera, and the mucous membranes were pale. The eyes, ears, nose and throat were not abnormal, except for the retinal examination, made by Dr. Harold Gifford, which showed many scattered hemorrhages. There was no evidence of redness of the tongue or papillary atrophy. There were a few pea-sized cervical lymph nodes but lymphadenopathy was not generalized. The lungs were clear and the heart was not remarkable in rhythm or sounds. There was a two plus sclerosis of the radial vessels, and the blood pressure was 112 systolic and 72 diastolic. The spleen was enlarged to 7.5 cm. below the left costal margin and

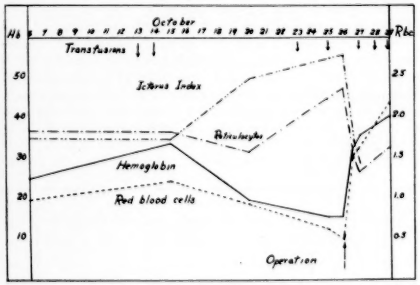

Chart 2.—Course in case 2.

was smooth and firm. There were no areas of abdominal tenderness and no abnormal masses palpable. The neurologic examination was negative.

A blood count disclosed a hemoglobin content of 57 per cent (8.2 Gm.), erythrocytes 2,860,000, and leukocytes 3,200 with 30 per cent of the segmented polymorphonuclear type, 31 per cent staff form, 26 per cent lymphocytes, 6 per cent monocytes and 1 per cent eosinophils. The smear of the red blood cells showed marked achromia with anisocytosis and poikilocytosis with a shift toward the macrocytic side, polychromatophilia and nucleated red cells (5 per hundred white cells). No spherocytes were noted. The mean corpuscular volume was 124 cubic microns, the mean corpuscular hemoglobin 32.4 micromicrograms, and the mean corpuscular hemoglobin concentration 28 per cent. The reticulocytes varied from 10.3 per cent to 14.3 per cent. The fragility of the red cells to hypotonic salt solution showed beginning hemolysis at 0.42 per cent and complete hemolysis at 0.32 per cent. The platelets numbered 230,000. The bleeding and clotting times were normal with firm and rapid retraction of the clot. The urinalysis was negative as well as the Wassermann reaction of the blood. The gastric content showed 13 degrees free acid and 27 degrees total acid; examination of the stool was negative for blood. The basal metabolic rate was minus 8 per cent. The blood nonprotein nitrogen was 35 mg. per hundred cubic centimeters. The van den Bergh test showed a direct, delayed, slight positive reaction, quantitative 17 mg. per liter. The bromsulphalein liver function test showed 50 per cent retention in five minutes and 10 per cent in thirty minutes. A biopsy of the bone marrow taken from the sternum revealed marked hyperplasia of the erythropoietic tissue.

Splenectomy was advised but the patient refused, and he was dismissed from the hospital with instructions to take weekly intramuscular liver extract and daily doses of reduced iron.

The patient returned to the hospital October 6 with a history of feeling moderately well until six weeks before admission, at which time he first noted vague pain in the upper part of the abdomen associated with frequent attacks of vomiting, increased pallor, deeper jaundice and progressive weakness. The stools were not clay colored and the pain was not colicky at any time. He requested splenectomy at this time.

The physical examination was essentially the same as on his previous admission. The jaundice was definitely more marked and the spleen slightly larger, extending 9 cm. below the left costal margin.

The blood count revealed a hemoglobin content of 25 per cent (4.2 Gm.), erythrocytes 1,000,000, and leukocytes 1,400 with the same differential formula. The fragility of the red cells remained normal, but the reticulocytes had increased to 37.5 per cent and the quantitative van den Bergh reaction was up to 68 mg. per liter. The icterus index was 35 units. The remaining blood studies were essentially the same as on his previous examination. Roentgenograms of the gallbladder failed to show any concentration of the dye, and no opaque calculi were discerned. A study of the gastrointestinal tract showed no abnormality.

In an attempt to build up the patient's general physical condition before operation, intravenous dextrose was administered frequently. In addition, transfusions of 500 cc. of whole blood, by the indirect citrate method, were given on two successive days. The hemoglobin increased to 34 per cent and the red cells to 1,250,000 with 2,600 white cells. Unavoidable circumstances prevented operation being performed at this time. The second day after the second transfusion the patient complained of a recurrence of the vague abdominal pain, which rapidly increased in severity. The jaundice became deeper, the spleen tender to palpation. What first appeared to be a biliary attack was really an acute hemolytic crisis in which the blood slowly decreased to a level of 20 per cent hemoglobin, 980,000 red cells and 2,250 white cells (chart 2). The reticulocytes were 39 per cent; the icterus index increased to 50 units. The stool was highly colored at all times and the van den Bergh reaction remained indirectly positive. Transfusions were resorted to again and two injections of 500 cc. were given on alternate days with no apparent reaction. Though the general condition improved somewhat, the blood count decreased to 16 per cent hemoglobin, the erythrocyte count to 510,000 and the leukocyte count to 2,000, so that emergency splenectomy was performed October 27. The subsequent postoperative course with complications of thrombosis of the splenic and hepatic veins and death has been the subject of another paper.[2]

COMMENT

When one considers the hundreds of patients with hemolytic jaundice and the number who have been subjected to transfusion either during the bouts of severe anemia accompanying a hemoclastic crisis or in the preparation for splenectomy, the incidence of unfavorable reactions must not be very great. Transfusions as a temporary measure in the acute episodes of destruction of the blood and as a routine preoperative procedure have long been advocated by many authorities.[3] Certainly transfusion is of distinct value in patients jaundiced as a result of biliary and hepatic disease.[4] In addition, transfusion is strongly recommended for the

2. Davis, H. H., and Sharpe, J. C.: Fatal Thrombosis of Splenic and Portal Veins Following Splenectomy, to be published.

3. These include:
Titletson, W.: Hemolytic Jaundice, Medicine **1**: 355-388 (Aug.) 1922.
Cheney, W. F., and Cheney, Garnett: Chronic Hereditary Jaundice, Am. J. M. Sc. **187**: 191-212 (Feb.) 1934.
Dudley, G. S.: Familial Hemolytic Jaundice, S. Clin. North America **16**: 839-842 (June) 1936.
Scott, A. M.: Acholuric Jaundice: The Serial Onset of Acute Blood Crisis in an Entire Family, Lancet **2**: 872-874 (Oct. 19) 1935.
Hurxthal, L. M.: Hemolytic Jaundice: Consideration of the Diagnosis and Treatment, S. Clin. North America **15**: 1475-1480 (Dec.) 1935.
Bazin, A. T.: Splenectomy: Operative Procedure and After-Care, Canad. M. A. J. **33**: 482-484 (Nov.) 1935.

4. Judd, E. S.; Snell, A. M., and Hoerner, L. C.: Transfusion for Jaundiced Patients, J. A. M. A. **105**: 1653-1658 (Nov. 23) 1935.

acute hemolytic anemia of Lederer,[5] although a fatal reaction has recently been reported.[6]

Lord Dawson [7] in 1931 was the first to mention the dangerous consequences of transfusion in hemolytic jaundice. In two typical cases in which preparations were made for splenectomy, and after every care in blood typing, transfusion resulted in death. A woman aged 65 with a red blood cell count of 3,050,000 received one transfusion followed by gradually increasing jaundice and death. The second patient, a woman aged 44, received three transfusions over a period of sixteen days, each followed by pyrexia (up to 104 F.), vomiting, diarrhea and deepening jaundice. Toward the end of the course there was increased anuria, which Dawson concluded was due to the blocking of kidney tubules by masses of acid hematin pigment, as shown by Baker and Dodds.[8] If transfusion is to be given to these patients, Dawson recommends the administration of an initial, small pilot dose of blood before the usual therapeutic amount is given. Wise [9] in 1933 warned of reactions following transfusion but cited no personal experience. Hartfall and Stewart [10] also in 1933 reported that a woman, aged 52, with typical familial hemolytic anemia and an erythrocyte count of 2,770,000, in preparation for splenectomy, received 500 cc. of type IV blood, following which jaundice increased markedly, with death occurring within twenty-four hours. The postmortem examination showed nothing of note except a massive heterotopia of bone marrow occurring in the thorax. Doan and his associates [11] in 1934 again warned that, the more severe the anemia in hemolytic jaundice, the greater the danger of transfusion. They concluded that transfusion was contraindicated as well as unnecessary. Lawrence [12] in 1937 cited the case of a woman aged 50 who before splenectomy reacted moderately after each of three transfusions. Except for a rise in temperature, Lawrence did not give the details of the reaction.

In both of our cases two transfusions were given on two successive days. Both patients were in a state of acute hemoclastic crisis, with the number of erythrocytes about one million, and both were being prepared for emergency splenectomy. Within a few hours after the second transfusion the patients complained of severe abdominal pain and backache. In case 2 the pain simulated biliary colic. Accompanying the abdominal pain there was an increase in the size and tenderness of the spleen, fever and intensification of the jaundice. In each instance the number of erythrocytes decreased to less than one million. The acute symptoms gradually subsided over a period of forty-eight hours, during which time there was no decrease in the amount of urinary output, hematuria or hemoglobinuria. Though both cases were complicated by the presence of biliary lithiasis, so common in hemolytic jaundice,[1] throughout the attack the stools continued to show bile and the van den Bergh reaction, though quantitatively increasing, remained indirectly positive. In each instance following the reaction the donor's blood was rechecked and found compatible with that of the recipient. In fact, in case 1 the same two donors were used again in transfusions following a later cholecystectomy without the appearance of the previous phenomena.

It is impossible as yet to determine definitely the underlying mechanism of these reactions. It may possibly be one factor or a combination of several factors. Doan and his associates [11] are of the opinion that the addition of transfused red cells from without only furnishes more material for hemolysis with consequent further pigmentary and toxic embarrassment of the liver and kidneys. On the other hand, these patients who require transfusion are usually in a severe hemolytic crisis, the cause of which is unknown. With their hemopoietic equilibrium already disturbed by the active hemolytic process, the destructive function of the spleen is further intensified by the procedure of transfusion. Apparently the erythropoietic equilibrium of construction-destruction is of such a delicate nature in hemolytic jaundice that the onset of crises may be initiated by dietary indiscretion, constipation, emotional disturbances, chilling, overexertion, acute infections, menstruation, pregnancy, high altitudes and surgical procedures. Finally, the reactions may be merely a part of that group of unexplained delayed post-transfusion reactions that Bordley [13] in 1931 and Goldring and Graef [14] in 1936 have so aptly summarized as occurring in any number of unrelated conditions. Their group of cases, however, differed somewhat in that they were characterized by the delayed onset of symptoms from one to two weeks after the transfusion and consisted of conditions ranging from drowsiness to coma and convulsions, accompanying marked renal insufficiency, and frequently led to death. At autopsy the kidneys were swollen and tubular epithelial cells contained droplets of peculiar pigmented material and showed advanced degenerative changes. In this group of delayed reactions jaundice was present in only a third of the cases and of mild grade, and there was no tendency for the hemoglobin and red blood corpuscles to decline such as was observed in our cases.

With this complication in mind, the problem naturally arises as to its prevention. A therapeutic lead that might prove of value comes from Witts,[15] who except in emergencies does not permit transfusions to be given until alkalis have been administered in sufficient dosage to render the urine alkaline. This dictum is substantiated by the recent experimental work of DeGowin and his co-workers,[16] who found that when the urine was alkaline the intravenous injection of a large amount of dog hemoglobin into dogs seemed to be innocuous. However, when the urine was acid, transfusion of hemoglobin sooner or later produced renal insufficiency from obstruction of the tubular lumens with masses of pigment derived from hemoglobin. Since transfusion may at times cause the appearance of more alarming symptoms, and even death in an already

5. Joules, H., and Masterman, L. M.: Acute Hemolytic Anemia of Lederer, Brit. M. J. **2**: 150-154 (July 27) 1935.

6. Payne, R. V.: Acute Hemolytic Anemia: Death After Transfusion, Guy's Hosp. Rep. **14**: 65-71 (Jan.) 1934.

7. Dawson, B. E.: Hemolytic Icterus, Brit. M. J. **1**: 921-928 (May 30), 963-966 (June 6) 1931.

8. Baker, S. L., and Dodds, E. C.: Obstruction of the Renal Tubules During the Excretion of Hemoglobin, J. Path. & Bact. **6**: 247-260 (Oct.) 1925.

9. Wise, W. D.: Hemolytic Jaundice, Am. J. Surg. **20**: 722-735 (June) 1933.

10. Hartfall, S. J., and Stewart, M. J.: Massive Paravertebral Heterotopia of Bone Marrow in a Case of Acholuric Jaundice, J. Path. & Bact. **37**: 455-459 (Nov.) 1933.

11. Doan, C. A.; Wiseman, B. K., and Erf, L. A.: Studies in Hemolytic Jaundice, Ohio State M. J. **30**: 493-504 (Aug.) 1934.

12. Lawrence, J. S.: Indications for Splenectomy in Medical Practice, Internat. Clin. **11**: 47 ser. 221-237 (June) 1937.

13. Bordley, James: Reaction Following Transfusion of Blood with Urinary Suppression and Uremia, Arch. Int. Med. **47**: 288-315 (Feb.) 1931.

14. Goldring, William, and Graef, Irving: Nephrosis with Uremia Following Transfusion with Incompatible Blood, Arch. Int. Med. **58**: 825-845 (Nov.) 1936.

15. Witts, L. J.: A Note on Blood Transfusion, Lancet **1**: 1297-1299 (June 22) 1929.

16. DeGowin, E. L.; Osterhagen, H. F., and Andersch, M.: Renal Insufficiency from Blood Transfusion, Arch. Int. Med. **59**: 432-444 (March) 1937.

critically ill patient with hemolytic jaundice, and since the usual antianemic drugs of iron and liver extract are of little or no avail,[17] it seems that one is left with little to combat the episodes of acute destruction of the blood. Attention is called to the recent observations of Doan [18] and others [19] as to the value of splenectomy in the patient with severe anemia. Suffice it to say, we have fully corroborated their work and conclusions, the details of which will be published in the near future. From our experience, we conclude that transfusion is dangerous in the presence of severe crises; it is contraindicated preoperatively and it is rarely necessary postoperatively.

CONCLUSIONS

1. In two cases of severe crises in hemolytic jaundice, transfusions caused unfavorable and dangerous reactions.
2. Caution must be used in the administration of transfusions to such patients.

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MULTIPLE PRIMARY MALIGNANT TUMORS

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The coexistence of more than one malignant tumor in the same individual has been observed and recorded on many occasions, and in recent years renewed efforts have been made to appraise its incidence by a careful examination of the material provided by large hospitals. According to Hanlon,[1] up to 1931 only in seven instances have large series of postmortem examinations been studied for the purpose of determining the frequency, distribution and other factors relating to the occurrence of multiple primary malignant tumors. Before 1931 von Hauseman,[2] Puhr,[3] Gade,[4] Feilchenfeld,[5] Redlich,[6] Reichelman [7] and Harbitz [8] made contributions to the subject. Since then Hanlon, Warren and Gates,[9] Schreiner and Wehr,[10] Bugher [11] and most recently Burke [12] have published excellent reports.

Hanlon was able to find only twenty-five reports in which three or more carcinomas were present in one individual. However, with more careful and complete postmortem examinations, especially in this country, more cases are steadily being reported. It is notable, as will be seen in the accompanying table, that in centers reporting the largest number of cases special attention has been paid to postmortem analyses of tumors and specialized facilities for therapy have attracted large numbers of patients affected with malignant disease.

The criteria necessary to make a diagnosis of multiple primary malignant tumors were first formulated seventy-seven years ago by Billroth [13] as follows:

1. Each tumor must have an independent histologic appearance.
2. The tumors must arise in different situations.
3. Each tumor must produce its own metastases.

Since then most authors have objected to the third requirement of Billroth, which has been considered as obviously too strict, and the following criteria observed by Warren and Gates have been accepted by most authors:

1. Each tumor must present a different picture of malignancy.
2. Each tumor must be distinct.
3. The probability of one metastasizing from the other must be excluded.

As the knowledge of carcinoma has increased and confidence in our ability to distinguish between primary tumors and metastases has been gained, there has been a liberalization in the requirements for making a diagnosis. In establishing the diagnosis of multiple primary carcinoma the greatest reliance has been placed on the distinct variation in the microscopic appearance of the several tumors.

Hanlon noted an extensive lapse of time between the appearance of the different new growths. He also noted from his examination of all available reports that the age incidence in this group of patients was of great interest. The average age of the patients who had three or more carcinomas was 63.6 years, while the average age of those who had two carcinomas was 58.8 years. These patients were several years older than those dying with a single malignant new growth. This statement is not in agreement with that of Warren and Gates, who concluded that multiple primary carcinoma occurs at approximately the same age as does a single lesion. However, other observers agree with Hanlon; they state that in most instances an interval of from five to twenty-three years elapsed between the development of the several tumors. Such is the experience of Hartman, who insists that he has cured by surgery several patients with primary neoplasm developing subsequent to the eradication of the first tumor in a separate and distant organ.

The distribution among the various organs corresponds closely with the percentage distribution of malignant new growth when it occurs singly.

It has been observed that the combination of malignant tumors in the genito-urinary and gastrointestinal tracts is relatively more frequent than other combinations. Carcinoma of the kidney of all types and carcinoma in various locations in the gastrointestinal tract have been recorded by Hanlon, Pietrusky,[14] Orr,[15] Nobiling,[16] Junghanns,[17] Tanberg [18] and others. Most of the kidney tumors recorded in the literature, however, were small and went unrecognized but possessed definite microscopic stigmas of a malignant condition. Most were slow growing and represented a low degree of malignancy. In Hanlon's group,

17. Sharpe, J. C.: The Hemolytic Anemias, Nebraska State M. J. **21:** 179-181 (May) 1936.
18. Doan, C. A.; Curtis, G. M., and Wiseman, B. K.: The Hematopoietic Equilibrium and Emergency Splenectomy, J. A. M. A. **105:** 1567-1575 (Nov. 16) 1935.
19. Cowen, S. O.: Treatment of Familial Acholuric Jaundice, Brit. M. J. **1:** 690-692 (April 4) 1936. Glover, D. M., and Fargo, W. C.: Familial Hemolytic Jaundice, Ohio State M. J. **29:** 428-432 (July) 1933.

From the Urological Department, Michael Reese Hospital.
Read before the Chicago Urological Society, March 25, 1937.

1. Hanlon, F. R.: Am. J. Cancer (supp.) **15:** 2001 (July) 1931.
2. von Hauseman: Ztschr. f. Krebsforsch. **1:** 183, 1904.
3. Puhr, L.: Ztschr. f. Krebsforsch. **24:** 38, 1926.
4. Gade, F. G.: Norwegian Cancer Commission, Oslo Institute, 1916.
5. Feilchenfeld, Josef: Inaug. Diss., Berlin, 1904, p. 5.
6. Redlich, W.: Ztschr. f. Krebsforsch. **5:** 261, 1907.
7. Reichelman, cited by Neprjachin, G. G.: Frankfurt. Ztschr. f. Path. **34:** 562, 1926.
8. Harbitz, F.: Beitr. z. path. Anat. u. z. allg. Path. (Ziegler's) **62:** 503, 1916.
9. Warren, Shields, and Gates, Olive: Am. J. Cancer **16:** 1358 (Nov.) 1932.
10. Schreiner, B. F., and Wehr, W. H.: Am. J. Cancer **20:** 418 (Feb.) 1934.
11. Bugher, J. C.: Am. J. Cancer **21:** 809 (Aug.) 1934.
12. Burke, M.: Am. J. Cancer **27:** 316 (June) 1936.
13. Billroth, Theodor: Chir. Klin. 1879, p. 258.
14. Pietrusky, F.: Centralbl. f. allg. Path. u. path. Anat. **32:** 394, 1921.
15. Orr, J. W.: J. Path. & Bact. **33:** 283 (April) 1930.
16. Nobiling, H.: Ztschr. f. Krebsforsch. **10:** 286, 1911.
17. Junghanns, H.: Ztschr. f. Krebsforsch. **29:** 623, 1929.
18. Tanberg, A.: Norsk. mag. f. lægevidensk. **4:** 983, 1906.

studied at the Mayo Clinic, the distribution of multiple primary cancers was as follows: kidney nine times, colon nine, thyroid four, stomach three, ovary two, and in the following locations one each: parathyroid, mouth, prostate, anal margin, uterus, breast, larynx, ileum and nose.

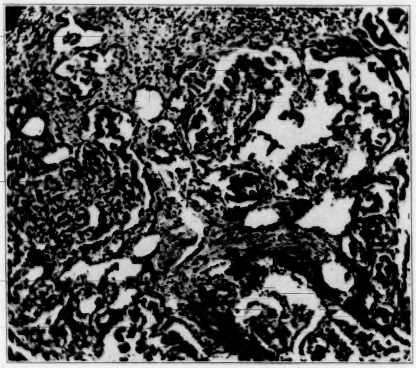

Fig. 1.—Adenocarcinoma of right kidney removed in 1915. Note papilliferous and tubular arrangement of cells.

Concerning the appearance of multiple primary malignant new growths, there are at least three different and divergent opinions expressed by various authors.

Centers from Which Large Number of Cases Have Been Reported

Author	Date	Place	Total Malignant Tumor Autopsies	Multiple Primary Malignant Tumors	Percentage of Multiple Primary Malignant Tumors
Egli: Cor.-Bl. f. schweiz. Aertzte **44**: 449, 1914	1914	Basel.....	906	20	2.07
Norwegian Cancer Commission [4]	1916	Christiania..	4,219	32	0.78
Harbitz [5].....	1916	Oslo.....	524	16	3.24
Puhr [3].....	1927	Budapest....	1,559	5	0.3
Hanlon [1].....	1931	Mayo Clinic..	710	18	2.5
Warren and Gates [9]	1932	Cancer Commission Harvard Univ.	1,078	40	3.7
Schreiner and Wehr [10]	1934	Buffalo Institute	11,212	307	2.7
Bugher [11].....	1934	U. of Michigan	983	28	3.1
Burke [12].....	1936	U. of Wisconsin	583	46	7.8

Ewing [19] is of the opinion that their occurrence can be explained on the grounds of mere coincidence. Orr concurs in this opinion, while Hanlon concludes that multiple primary cancers represent incidental occurrences rather than a definite response to any law of neoplastic formation. Murray [20] and others believe that the presence of one malignant new growth has an inhibitory influence on the development of a second. On the other hand, Warren and Gates express the opinion that multiple primary malignancies may be explained by a predisposition or susceptibility to carcinoma in certain persons or to the action of some factor favoring the development of a malignant condition but conclude that the nature of this predisposition is as yet unknown. This point of view coincides with that of Hartmann [21] and others. Hurt and Broders [22] concluded that the incidence of multiple malignant growths is greater than recorded and noted a positive hereditary factor in 28.6 per cent. Bugher, using the United States mortality statistics, computed the expected occurrence of multiple primary malignant growths on the basis of chance and found it to be exceeded by the actual occurrence; he says that the authors who have reported the largest series of multiple cancers have felt that these tumors occur more frequently than chance alone can explain and that their actual frequency exceeds their reported incidence.

The case here reported is of interest, I believe, not only because the patient had three separate and distinct primary cancers diagnosed clinically but also because he lived twenty-one years after nephrectomy for cancer of the kidney. During this long period, although this is not a record for this type of lesion, he showed no evidence of recurrence and at autopsy no vestige of this tumor was discovered after minute examination of all the tissues. A condensed history is as follows:

REPORT OF CASE

A man, aged 49, entered the Michael Reese Hospital in March 1915. He stated that four years before he began to pass blood in the urine. The hematuria was not accompanied by pain before, during or after micturition. There was no urinary frequency. Blood reappeared in the urine at intervals of from six to eight weeks and lasted each time from one to three weeks. About two years before his entrance to the hospital, marked gross hemorrhage appeared in the urine and at this time he first noted slight pain in the penis during the act of urination, and he began to void more frequently. During the past two years (1913-1915) besides the appearance of hematuria he suffered attacks of pain in the right lumbar region. These

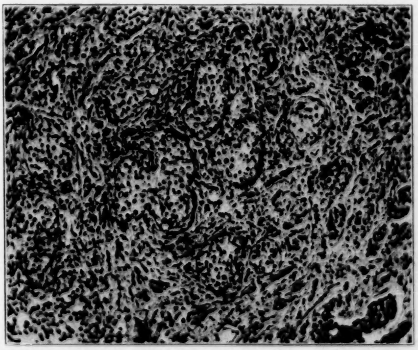

Fig. 2.—Primary carcinoma of prostate. Note large oval and polygonal cells with vesicular nuclei showing atypical mitotic figures.

were of short duration, lasting but a few minutes to twenty or thirty minutes—never longer—and would recur every four to six weeks. Blood was always seen in the urine during or after an attack. During the six months previous to admission to the hospital, the hematuria had become much worse and was more frequent.

19. Ewing, James: Neoplastic Diseases, ed. 3, Philadelphia, W. B. Saunders Company, 1928.
20. Murray, J. A.: Lancet **2**: 800 (Oct. 15) 1927.
21. Hartmann, H.: Bull. Acad. de méd., Paris **114**: 480 (Nov.) 1935.
22. Hurt, H. H., and Broders, A. C.: J. Lab. & Clin. Med. **18**: 765 (May) 1933.

The past history was negative except for stomach trouble seventeen years before. In the family history it was noted that his wife had had one miscarriage and that they had one living child, 14 months of age. He had had gonorrhea several times; the history of syphilis was doubtful.

Physical examination was negative except for rigidity over the right lumbar region.

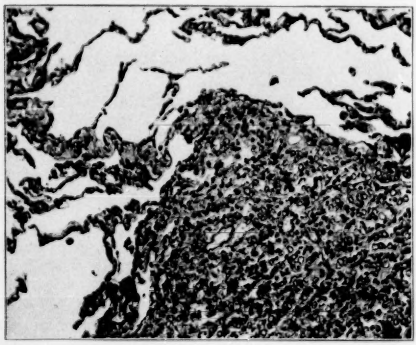

Fig. 3.—Metastasis to lungs. Note characteristic large vesicular nuclei with prominent nucleoli similar to those seen in section from prostate.

Cystoscopy was negative except for slight encroachment of the prostate on the internal urethral orifice.

X-ray examination revealed a calculus in the right kidney, which was probably in a calix, and a second stone at the ureteropelvic junction.

Laboratory examinations at that time gave the following results: Repeated urinalyses showed specific gravity from 1.020 to 1.028. The reaction was consistently acid. There was constantly a 1 plus albumin reaction. Neither sugar nor acetone was found at any time. Microscopic examinations at no time showed casts, but white blood cells were always present in from five to fifteen cells per high power field to many, and the red blood cells varied from none to an occasional one.

Right nephrectomy was done in March 1915 by Dr. Kolischer. When he exposed the kidney a tumor mass was seen involving the middle third. The gross description of the kidney removed was as follows:

The kidney was slightly increased in size and measured 12 by 6 by 4 cm. It showed a cortical nodule occupying the whole of the middle third of the kidney, involving the whole thickness of the cortex and invading the pelvis. The tumor was spherical and measured 4 cm. in diameter. It was nodular and of firmer consistency than the kidney. The color was variegated from a yellowish to a bluish tinge. No secondary nodules were found. There was a small irregular stone lodged in one of the calices.

The patient again entered the hospital in 1926 for a spinal puncture, which confirmed the clinical diagnosis of tabes dorsalis, after which he remained under treatment for this condition for one year.

Ten years later, in July 1936, at the age of 70, he was sent to the hospital for urologic study, from the outpatient department. At this time he complained of frequency of urination, nocturia and dribbling, all of about three years' duration.

The history taken at this time stated that these symptoms had been of a mild nature for the preceding two or three years. He also complained of pains beginning in the lumbar region and radiating down both legs. These pains had been present for about one year. They were quite severe three weeks before admission to the hospital but were relieved by rest in bed. On entrance the temperature was 98.2 F., pulse 78 and respiratory rate 18. The blood pressure was 115 systolic, 70 diastolic. The essential physical observations were as follows: The pupils were normal (?). The cervical lymph nodes were enlarged. The chest was emphysematous and the heart tones were distant. The knee and ankle jerks were bilaterally absent. There was an old scar on the penis. Rectal examination showed an enlarged prostate of markedly increased consistency. The outline was irregular and the surface nodular. A diagnosis of carcinoma of the prostate was made. Tabes dorsalis also was diagnosed. Metastases to the bones from cancer of the prostate were suspected, but x-ray examination failed to verify this assumption.

Other laboratory examinations were as follows: Further roentgenologic examination showed a point of obstruction in the hepatic flexure of the colon, causing delay in the passage of the barium sulfate meal. An opaque enema did not pass beyond the sigmoid. These observations were interpreted as probable carcinoma of the colon.

The Wassermann reaction of the blood was negative, while the spinal fluid yielded a positive Wassermann reaction.

The blood count showed 4,150,000 red blood cells, 75 per cent hemoglobin and 9,700 white blood cells.

Examination of the urine was negative for all pathologic elements.

Examination of the stools showed a 3 plus test for occult blood.

No urologic intervention was deemed necessary on account of the relative mildness of the urinary symptoms and because of the suspected carcinoma of the colon. The patient was therefore transferred to the medical department, where he died six weeks after admission to the hospital.

A condensed report of the autopsy protocol enumerating only the essential observations is as follows:

Enlarged masses of lymph nodes were found along the aorta, as well as marked involvement of the tracheobronchial, retroperitoneal and presacral chains. On section the nodes were a grayish white and of firm consistency.

Both lungs showed grayish white membrane-like, slightly elevated areas on the pleural surfaces.

In the proximal sigmoid was a firm, annular lesion with rolled borders which projected into the lumen of the bowel. It measured 3 cm. in diameter. The mucosa was ulcerated and replaced by a fungating mass.

The prostate was moderately enlarged and semifirm to firm in consistency. On section its normal architecture was obscured by multiple grayish white plaques with irregular outlines. There was no obvious obstruction of the prostatic urethra.

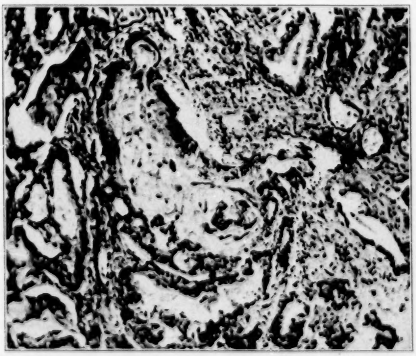

Fig. 4.—Primary adenocarcinoma of sigmoid colon. Note infiltration of muscularis and submucosa by anaplastic cells, arranged in acinous and tubular conformation.

The posterior columns of the cord were small and atrophic, and in the middorsal region were areas of softening. There was some atrophy of the left cerebral cortex.

The microscopic report of the three tumors follows:

Right Kidney (removed in 1915).—The tumor varied in characteristics from areas with solidly packed cells to areas with reproduction of glandular lumens and proliferation of cells in papilliferous arrangement. The cells varied markedly in size and shape. In the more papilliferous portions there were large oval

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cells with abundant eosinophilic cytoplasm and round, moderately chromatic nuclei. In these areas as well as elsewhere there were smaller cells with less cytoplasm and more hyperchromatic nuclei. Few mitotic figures were evident. Fibrous connective tissue was abundant and contained a marked lymphocytic infiltration. In one area several hyalinized and partially hyalinized glomeruli were present.

Prostate.—Within the prostatic parenchyma, which was involved by diffuse hyperplasia of the glandular structures, were several areas in which the epithelium of the acini completely filled their lumens. The cells were large, from oval to polygonal in shape, and contained a faint eosinophilic cytoplasm. Cell borders were distinct. The nuclei were large, oval to round in outline, pale and containing faint chromatin granules with prominent nucleoli. Atypical mitotic figures were frequently present. Elsewhere definite structure was absent and the connective tissue and smooth muscle were widely infiltrated by rounded masses, strands and individual cells of similar type interspersed, however, with many smaller cells containing hyperchromatic nuclei. In several smaller vessels, masses of both types of cells plugged the lumens. They were also characteristically arranged about some of the nerve fibers.

Lung Metastases.—Sections from the lungs revealed solid masses of cells similar to those in the prostate invading perivascular connective tissue and extending along the septal walls. The characteristic large vesicular nuclei with prominent nucleoli were noteworthy.

Sigmoid.—Sections from the tumor in the sigmoid colon revealed degenerative and necrotic changes in the mucosa with loss of cell outlines, pyknosis and fragmentation of nuclei, and also an infiltration with lymphocytes. The submucosa and muscularis, the latter much thickened, were widely infiltrated by irregular acinous and tubular structures lined by one or two layers of extremely anaplastic cells. A basement membrane was not present. The cells varied greatly in size and ranged in shape from spindle to oval to columnar. Their nuclei varied extremely from hyperchromatic spindle-shaped types to large pale oval types with small chromatin granules and occasional large nucleoli. Atypical mitotic figures were present in moderate number. In many of the glandular lumens a pale mucoid material was present.

The pathologic diagnosis after autopsy was (1) absent right kidney; (2) primary carcinoma of the prostate with metastases to the lungs, retroperitoneal, presacral and tracheobronchial lymph nodes; (3) primary adenocarcinoma of the sigmoid colon with stenosis of its lumen; (4) multiple adenomas of the left kidney; (5) compensatory hypertrophy of the left kidney; (6) generalized arteriosclerosis and coronary sclerosis; (7) healed myocardial infarct, and (8) fibrosis of the myocardium.

COMMENT

A man who died in 1936 had been operated on twenty-one years before for adenocarcinoma of the kidney. He later was affected with two other primary cancers in distinct and separate organs, one of which, that of the prostate, produced metastases to the lungs and lymph nodes. All three cancers were diagnosed clinically.

It is my belief, after a rather complete survey of the literature, that:

1. Multiple primary cancers are more frequent than are reported.

2. They occur more frequently than chance alone would explain.

3. The percentage of multiple primary malignant tumors to be reported in the future will be higher than that recorded in the past, because

(*a*) More people are reaching advanced years, a period in which the incidence of cancer is generally high.

(*b*) Since the inauguration of cancer clinics and commissions throughout the world, cancer patients have been more concentrated and more thoroughly studied.

(*c*) Better results are being obtained in the treatment of cancer than heretofore.

(*d*) As a result of longer survival after treatment for a single primary tumor, time is afforded for the development of subsequent primary cancers.

(*e*) Autopsies are more widely done and with greater thoroughness than in the past.

4. Some factor, as yet unknown, possibly hereditary or hormonal in nature, plays an important part in susceptibility to malignant disease and the varied responses to environment in different individuals depends on this unknown element.

25 East Washington Street.

THROMBOSIS OF THE AXILLARY VEIN

REPORT OF FIVE CASES WITH COMMENTS ON ETIOLOGY, PATHOLOGY AND DIAGNOSIS

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NEW YORK

Thrombosis of veins is common in the pelvic region and in the lower extremities. It may follow abdominal operations or develop during the puerperium. Thrombus formation in the veins of the upper extremities, secondary to such conditions, is not common, and thrombosis of the axillary vein caused by effort is comparatively rare.

As a clinical entity the condition was first described by Von Schrötter in 1884. Cadenat [1] in 1920 reviewed twenty-four cases from the literature. Paggi [2] in 1933 collected reports of seventy-four cases from medical writings. Matas [3] in 1934 reported one case and reviewed the literature of approximately 100 cases. Since then about twenty additional cases have been described by various observers, but great numbers have not been observed by any one person.

A review of the cases by the various authors showed that the patients were young, in good health and engaged in work. Although males were affected to a greater degree, cases in females were reported by Rosenthal,[4] Cadenat,[1] Winterstein,[5] Finkelstein [6] and Clute.[7] The right arm was affected more often than the left, and those in whom the left arm was involved were either left handed or threw an unusual strain on the left hand. The condition followed an unusual or sudden effort contracted while engaged in heavy work or developed after a casual strain such as is associated with checking and restraining a horse.[8] It also followed strains that resulted from causes such as swinging at a golf ball, pitching a baseball or exercising in a gymnasium.[9] Cases have also been reported in which

From the Peripheral Vascular Disease Clinics of the Gouverneur and Bellevue hospitals.

1. Cadenat, F. M.: Les thrombophlébites du membre supérieure, Paris méd. **35**: 253-259 (March 20) 1920.
2. Paggi, B., quoted by Matas.[3]
3. Matas, Rudolf: Primary Thrombosis of the Axillary Vein Caused by Strain, Am. J. Surg. **24**: 642-666 (June) 1934.
4. Rosenthal, W. J.: Ueber Thrombose an der oberen Extremität nach Anstrengungen, Deutsche Ztschr. f. Chir. **117**: 405-424 (July) 1912.
5. Winterstein, O.: Ueber Gefässverletzungen mit Beiträgen zum traumatischen segmentären Arterienspasmus und zur "traumatischen" Thrombose der Vena subclavia, Schweiz. med. Wchnschr. **55**: 360 (April 23) 1925.
6. Finkelstein, B.: Benigne Thrombose der oberen Extremität, Deutsche med. Wchnschr. **35**: 198 (Jan. 28) 1927.
7. Clute, H. W.: Idiopathic Thrombosis of the Axillary Vein, S. Clin. North America **11**: 253-259 (April) 1931.
8. Scherpleman, E.: Kasuistische Beitrage zur Venenthrombose mit besonderer Berücksichtigung alterer and neuerer Theorien der Thrombose, Beihefte z. med. Klin. **7**: 23-54, 1911.
9. Barker, N. W.: Axillary Thrombophlebitis Caused by Strain or Effort, Proc. Staff. Meet., Mayo Clin. **10**: 156 (May 6) 1935.

the thrombus developed spontaneously without any accidental strain.[10]

I am herewith presenting five cases of thrombosis of the axillary vein in males. At the time this process developed the patients were in good health and showed no pathologic defects to account for such a condition.

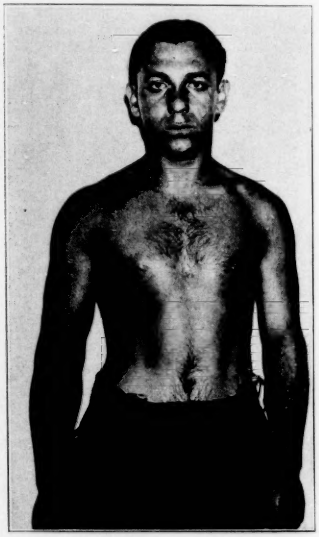

Fig. 1 (case 1).—Comparative size of the arms, the right being larger than the left.

REPORT OF CASES

CASE 1.[11]—J. C., a man, aged 24, admitted to the clinic July 1, 1936, complained of enlargement and hardness of the right upper extremity and prominence of the veins of the right arm as compared with the left. For the previous year and a half he had been employed as a clothes presser, at which occupation he used his right arm constantly. The past and family history were entirely negative. Three months prior to his coming to the clinic, he suffered from a cellulitis of the right leg. This was treated by rest and by wet dressings and subsided without any operative intervention. One month prior to his appearance at the clinic his attention was called to the fact that his right hand was larger than the left and that the fingers of the right hand were darker than those of the left. The right upper extremity, as far as he could remember, had never been swollen and there had been no impairment of function at any time.

The patient was robust and well nourished; he weighed 147 pounds (66.7 Kg.) and was 65 inches (165 cm.) tall. The general physical examination was entirely negative except for the right upper extremity.

The right upper extremity from the shoulder girdle to the fingertips was larger than the left. The skin had a slight tinge of rubor. Fulness over the anterior wall of the chest below the clavicle and prominence of the veins over the internal aspect of the arm and the axilla and the anterior aspect of the chest were noted. The veins collapsed slowly on elevation. There was no clubbing of the fingers; no cord or lymph glands were palpated in the axilla. The enlargement was due to a brawny induration. Motion in the joints was unrestricted and sensations were unimpaired. Pulsations in the brachial, radial and ulnar arteries were equal in rate and rhythm as compared with the left. The hand grips were equal in force. The pulses of the lower extremity were all open. The measurements of both upper extremities are given in table 1.

TABLE 1.—*Measurements of Both Arms (Case 1)*

	Right	Left
At junction of humerus and shoulder	39.6 cm.	33 cm.
Midhumeral	30.5 cm.	27 cm.
Elbow	28.5 cm.	26.2 cm.
Midforearm	27.5 cm.	24.6 cm.
Wrist	18.5 cm.	16.5 cm.
Hand	22.25 cm.	20.5 cm.
Temperatures at different levels measured with an electric potentiometer were equal		
Midhumeral	31.8 C.	31.8 C.
Midforearm	32.6 C.	32.8 C.
The blood pressure on the affected side was less than on the other side	90/50	98/60
The oscillometric index on the right side was less than that on the left		
Midhumeral	10	11 plus
Midradial	5	6
The venous pressure was increased on the right side		
Cephalic vein	2 8 mm.	118 mm.
Basilic vein	200 mm.	100 mm.
The blood count and urine were normal and the Wassermann reaction of the blood was negative		

Radiographic examination of the chest, cervical spine and right shoulder failed to reveal any tumor masses, presence of the cervical rib or changes in the joints.

Fig. 2 (case 1).—Visualization of upper extremities by means of infrared rays. The veins of the right arm and of the right side of the chest are more numerous and prominent.

Radiographic examination of the right upper extremity following the injection of 10 cc. of thorium dioxide sol into the median cephalic vein visualized the vein up to the junction of the upper and middle third of the humerus, at which point numerous venous collaterals were seen on the external aspect of the humerus. Collaterals were also noted in the shoulder and supraclavicular regions. The cephalic vein failed to empty

10. Pellot: Un cas de thrombose veneuse du membre supérieur droit (phlébite par effort), Presse méd. **24**: 523 (Nov. 20) 1926. Lohr, W.: Ueber die sogenannte traumatische Thrombose der Vena Axillaris und Subclavia, Deutsche Ztschr. f. Chir. **214**: 263-299 (Feb.) 1929. Veal, J. R., and McFetridge, E. M.: Primary Thrombosis of the Axillary Vein, Arch. Surg. **31**: 271-289 (Aug.) 1935.

11. Kaplan, Theodore, and Katz, Abraham: Thrombosis of the Axillary Vein, Am. J. Surg. **37**: 326-333 (Aug. 1) 1937.

directly into the axillary. Two venous segments were also noted in the infraclavicular region, the upper one corresponding to the terminal portion of the cephalic vein at the site where it usually empties into the axillary, and the lower one representing the narrowing of the axillary vein. It received the venous tributary running from the point of the interruption to the cephalic vein across the humerus to be joined by the long thoracic vein that is visualized. Another venous collateral was also seen coming across just at the level of the head of the humerus and emptying into the same segment.

Examination of the right arm immediately after the first plate was taken revealed the dye still present in the vein at the level of the junction of the middle and upper thirds of the humerus, and several venous collaterals were still visualized on the external aspect of the shoulder. The two venous segments previously reported were still visualized, and the collaterals emptying into it were no longer seen.

Examination of the right upper extremity following the injection of 10 cc. of thorium dioxide sol into the median basilic vein showed the basilic vein to be well visualized and

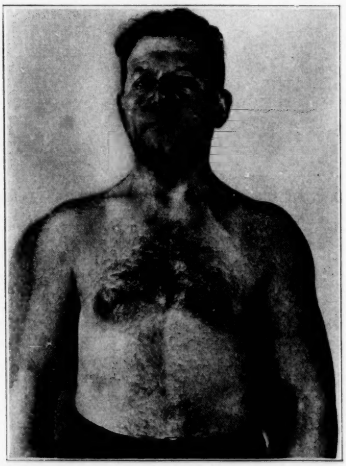

Fig. 3 (case 3).—Comparative size of the arms, the left being larger than the right.

distended. The valves were dilated and the vein was tortuous. Examination of the right arm, directly after the previous plate was taken, revealed the dye to be still faintly present at the site of the valves.

Infra-red photography of the right pectoral and upper arm regions visualized more veins as compared with the left.

CASE 2.—D. H., a man, aged 25, employed as a salesman, admitted to the clinic Sept. 11, 1936, complained of a difference in the size of his arms, the right being larger than the left. His previous history, both personal and family, was irrelevant.

In the latter part of May 1935, after pitching a ball, he felt a slight soreness in the muscles of the right arm. He massaged the arm and obtained relief temporarily. The following morning the arm was painful, and toward evening the entire right upper extremity was swollen and blue. There was never any acute pain, although function in the arm was impaired; nor was he confined to bed because of a rise in temperature. He kept the arm in a sling and applied wet dressings, and the edema subsided. However, after the slightest exertion, such as carrying a 5 pound weight, the arm from the wrist to the shoulder would become swollen, tired and heavy. When he awoke in the morning the arm always seemed normal in size and color. As time went on, however, the veins became prominently displayed over the arm and chest, and the right arm became red as compared with the left.

The patient was robust and well nourished; he weighed 170 pounds (77 Kg.) and was 70½ inches (179 cm.) tall. The

Fig. 4 (case 3).—Film taken immediately after the injection of 10 cc. of thorium dioxide sol into the cephalic vein. The cephalic vein is visualized up to the level of the surgical neck of the humerus, at which point it terminates into a Y bifurcation. The lateral thoracic vein is filled, as well as the jugular in the neck above the clavicle, with a backflow downward anteriorly to the level of the second rib. The veins in the neck are seen to make a loop terminating below the clavicle.

entire physical examination was negative save for the upper right extremity. The latter was larger than the left with fulness over the right upper wall of the chest anteriorly.

Fig. 5 (case 3).—Numerous superficial veins over the left arm, shoulder region and chest visualized by infra-red rays.

Numerous veins were seen over the forearm and arm, in the axilla and anteriorly over the chest. The veins collapsed slowly on elevation and no clubbing of the fingers was noted. A cord present in the axilla was not tender. No lymph glands were palpable in the cervical and axillary regions. The pulses were

open and were equal in rate and rhythm as compared with the left. Motion was unrestricted, sensations were unimpaired and the reflexes were normal. The measurements of both upper extremities are shown in table 2.

Injection of the right median basilic vein with 10 cc. of dye revealed the basilic vein to be dilated and the valves prominent.

Fig. 6 (case 4).—Increase in the number of superficial veins of both arms shown by infra-red rays.

No collaterals were visualized. A film taken immediately after the first plate showed the dye to be still present at the site of the valves.

TABLE 2.—*Measurements of Both Arms (Case 2)*

	Right	Left
At junction of humerus and shoulder	33.75 cm.	30 cm.
Midhumeral	30 cm.	27.5 cm.
Elbow	27.5 cm.	26.25 cm.
Midforearm	27.5 cm.	25 cm.
Wrist	17.5 cm.	17 cm.
Hand	23.75 cm.	22.5 cm.
The temperature of the right upper extremity at different levels was definitely less than that of the left		
Midhumeral	31.8 C.	32.4 C.
Elbow	31.8 C.	33.2 C.
Midforearm	31.0 C.	33.2 C.
Wrist	32.0 C.	32.6 C.
The blood pressure of the right arm was greater than that of the left	130/72	120/70
The oscillometric index on the right side was greater than on the left		
Midhumeral	11 plus	10 plus
Midradial	3⅝	4 plus
The venous pressure was increased in the right arm		
Basilic vein	200 mm.	160 mm.
The circulation time with calcium gluconate in the affected side was prolonged		
Basilic vein	27 seconds	14 seconds
The blood count and urine showed no abnormalities and the Wassermann reaction of the blood was negative		

Photographs taken with infra-red technic revealed an increase in the number of veins in the right upper extremity as compared with the left.

CASE 3.—L. K., a man, aged 42, employed as a tailor, admitted to the clinic in February 1937, complained of an enlargement of the left arm of twenty years' duration.

His past and family history was negative. Twenty years before he was admitted he fell in the street and injured his left hand. Four hours later the entire upper extremity became swollen, and he was unable to lift anything. The swelling lasted for two days, during which time he was disabled. Since then he has been working, although his left arm feels weak. In August 1936, after lifting a weight, his hand became red, painful and swollen and has so continued.

Inspection of both upper extremities revealed the left arm, which had a dusky color, to be larger than the right. The veins were markedly prominent over the left arm, left side of the chest and the left axilla as compared with the right, and collapsed slowly on elevation. A distended vein could be seen running over the neck anteriorly and over the chest. A cord

TABLE 3.—*Measurements of Both Arms (Case 3)*

	Right	Left
Junction of shoulder and arm	29 cm.	33.5 cm.
Midhumeral	28 cm.	33 cm.
Elbow	24.5 cm.	28 cm.
Forearm	26 cm.	28.5 cm.
Hand	21.4 cm.	22.25 cm.
The temperature measured with an electric potentiometer was slightly greater on the right side		
Midhumeral	32.8 C.	32.4 C.
Midforearm	31.8 C.	31.6 C.
Index finger	31.2 C.	30.4 C.
The blood pressure on the affected side was less than on the other	130/84	118/80
The oscillometric index on the left side was less than on the right		
Midhumeral	15 plus	11 plus
Wrist	8	5
Circulation time with calcium gluconate was prolonged in the left basilic vein		
Basilic vein	10½ seconds	18½ seconds
The venous pressure was increased on the affected side		
Cephalic vein	110 mm.	180 mm.
The urine and blood count were normal and the Wassermann reaction of the blood was negative		

could be felt in the axilla but it was not tender. The pulses were open and of equal intensity. The hand grip on the left side was weaker than that on the right.

The measurement of the extremities showed the left to be definitely larger than the right (table 3).

Injection of 10 cc. of thorium dioxide sol into the cephalic vein visualized it up to the level of the surgical neck of the

Fig. 7 (case 4).—Film taken immediately after 10 cc. of thorium dioxide sol was injected into the median basilic vein. The vein is dilated with collaterals in the supracondyle region on the internal aspect of the humerus. Numerous collaterals are seen on the external aspect of the arm. Communicating branches between the basilic vein and the collaterals are seen. The valves are markedly dilated. The lateral thoracic vein is partly filled. Veins are visualized in the supraclavicular and cervical regions.

humerus, at which point it terminated with a bifurcation into a Y. The lateral thoracic vein was seen filled, as well as the jugular in the neck above the clavicle, with a backflow downward anteriorly to the level of the second rib. The veins in

the neck are seen to make a loop terminating below the clavicle. The second film, taken about two minutes later, still visualized the lateral thoracic vein.

Infra-red photographs revealed a marked increase in the number and distribution of the veins in the left side as compared with the right.

CASE 4.—H. C., a man, aged 40, an Albanian, reporting to the clinic April 23, 1937, complained of a painful and swollen

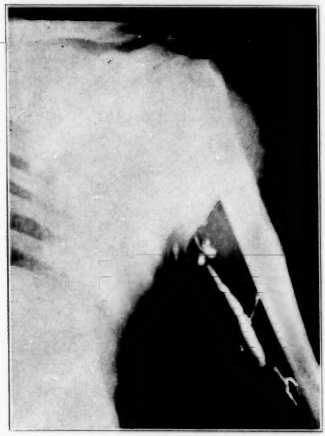

Fig. 8 (case 4).—Second film, taken two minutes after figure 7, showing the dye present in the vein. The valves are not as well visualized as in the previous film. The veins in the neck and supraclavicular regions are not seen.

upper extremity. April 21, 1937, at about 8 a. m., he lifted a cake of ice and experienced a slight pain in the arm. At 11 o'clock he noticed that his right hand became stiff, swollen and cold. He kept the hand over a gas heater to warm it up, but the swelling progressively increased. The pain was constant and dull in character, and he was unable to work.

TABLE 4.—*Measurements of Both Arms (Case 4)*

	Right	Left
Junction of shoulder and arm	34 cm.	32 cm.
Midhumeral	31 cm.	27 cm.
Elbow	27 cm.	24 cm.
Midforearm	30 cm.	27 cm.
Wrist	17.5 cm.	16.5 cm.
Hand	23.5 cm.	22 cm.
The temperature measured with an electric potentiometer was slightly greater on the left side		
Midhumeral	30 C.	31.5 C.
Midforearm	30.6 C.	31.6 C.
Thumb	30 C.	32.4 C.
Index finger	32 C.	32 C.
Middle finger	31.2 C.	32 C.
Ring finger	31.2 C.	32 C.
Little finger	31.2 C.	32 C.
The blood pressure on the affected side was less than on the left side	120/70	126/80
The oscillometer readings on the right side was lower than on the left		
Midhumeral	9	11
Wrist	4	4½
The circulation time with calcium gluconate was prolonged		
Basilic vein	24 seconds	14 seconds
The venous pressure was markedly increased in the right basilic vein		
Basilic vein	430 mm.	110 mm.
The blood count and urine were normal and the Wassermann reaction of the blood was negative		

Examination was negative except for the local condition. The right arm was larger than the left and the skin had a dusky color. The veins stood out prominently over the arm and chest, and venules were noted on the right side of the chest. The veins collapsed slowly on elevation. No tender cord was felt in the axilla. The fingers were larger than those on the left and were cyanotic. The pulses were open.

The measurements of both upper extremities are given in table 4.

A film taken immediately after the injection of 10 cc. of thorium dioxide sol into the median basilic vein showed the vein to be dilated with collaterals in the supracondylar region on the internal aspect of the humerus. Numerous collaterals were seen on the external aspect of the arm. Communicating branches between the basilic vein and the collaterals were seen. The valves were markedly dilated. The lateral thoracic vein was filled in part. Veins were also seen in the supraclavicular and cervical regions.

A second film taken two minutes after the first visualized the dye in the vein, although the caliber was diminished. Occasional collateral veins were seen on the external aspect, and the veins in the neck were no longer visualized.

A third film taken ten minutes after the injection showed shadows of dye remaining in the basilic vein at the site of the valves.

Infra-red photography showed numerous veins on both upper extremities but more on the right.

CASE 5.[11a]—J. R., a Negro, aged 37, employed as a garage worker, reporting to my office on May 15, 1937, complained of pain and enlargement of the left arm. On April 13, 1937, he picked up an automobile battery from the floor and, as he did so, felt a sudden pain in the left arm. The pain was so sharp that he had to drop the battery. One-half hour later his arm became swollen and turned blue. He was treated with rest in bed, heat and massage, and the edema subsided. On May 10

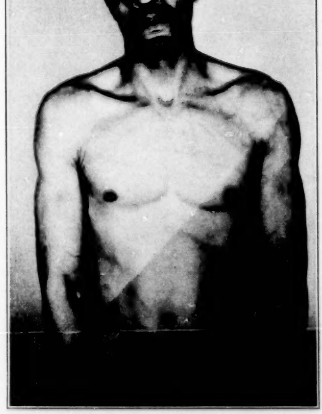

Fig. 9 (case 5).—Increased number of veins over the anterior aspect of the chest, arm and forearm visualized by infra-red rays.

he returned to work. The swelling returned, however, and he was forced to discontinue work.

Examination was negative save for the local condition of the left upper extremity. The left arm was larger than the right. The veins were markedly dilated over his arm and side of the chest and did not collapse on elevation. On the left lateral thoracic wall a prominent dilated vein was noted. A hard tender cord was felt in the left axilla, which was continuous

11a. This patient was seen through the courtesy of Dr. Saul S. Samuels of New York.

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along the course of the basilic vein down to the midforearm, and the entire vein was thrombosed and, because of the thrombosis of the basilic vein, the venous pressure, circulation time and venograms were not taken.

The measurements of both upper extremities are given in table 5.

Infra-red photographs showed numerous veins over the anterior chest, axilla and arm, as compared with the right.

ETIOLOGY

According to Cadenat,[1] Von Schrötter in 1884 described this condition and advanced the theory that, as a result of a sudden stretching and compression of the vein, a localized phlebitis followed, which in turn produced a thrombosis of the vein. Lowenstein[12] in 1924 dissected thirty-seven cadavers and found that with the arm in the abducted position in certain cadavers, the costocoracoid ligament and subclavius muscle indented the axillary vein. When the arm is held in abduction or extension the axillary vein is distended. Distention of the axillary vein with pressure on it by the costocoracoid ligament and subclavius muscle was sufficient to produce thrombosis.

Gould and Patey[13] confirmed this observation. They injected plaster of paris into the axillary vein of cadavers with the arm in the abducted position and

TABLE 5.—*Measurements of Both Arms (Case 5)*

	Right	Left
At junction of shoulder and arm	26 cm.	30 cm.
Midhumeral	27 cm.	29.5 cm.
Elbow	25 cm.	26 cm.
Midforearm	26 cm.	26 cm.
Wrist	16.5 cm.	17.5 cm.
The temperature measured with an electric potentiometer was slightly less on the affected side		
Midhumeral	33.6 C.	33.2 C.
Thumb	33.8 C.	32.8 C.
Index finger	34.2 C.	33.6 C.
Middle finger	33.6 C.	33.4 C.
Ring finger	32.8 C.	32.4 C.
Little finger	32.8 C.	32.4 C.
The blood pressure on the affected side was slightly less than on the other side	90/70	92/70
The oscillometric index on the right side was equal to that on the left		
Midhumeral	14	14
Wrist	4	4

observed, in two cases, deep grooves corresponding in one to the pressure of the subclavius muscle and, in another, a shallow groove corresponding to the position of the costocoracoid ligament. They also demonstrated a competent bicuspid valve at the level of the subclavius muscle which was so placed that pressure of the muscle stretched the wall of the vein in its long axis. They were of the opinion that the subclavius is responsible for trauma to the vein and that, as a result of this trauma, a valve is ruptured. This rupture, according to them, is the fundamental basis for the thrombus.

Veal and McFetridge[10] on the basis of roentgen and autopsy studies reported that the constriction of the vein occurred, not as was previously believed over the first rib beneath the subclavius muscle, but below the head of the humerus and against the subscapularis muscle.

Although these facts may be true in cases in which marked trauma has occurred, it still does not explain the cases in which trauma was slight or those occasional spontaneous cases without any history of injury.

As for infection, Matas reported twenty-seven cases in which the thrombus was removed and seven of them were subjected to culture. In four of the seven thrombi the cultures were sterile. In the others the cultures yielded bacterial growths, but changes in the vessel wall indicated the presence of a severe inflammatory type of septic phlebitis. Other evidences against infection are, however, the clinical history, the absence of a rise in temperature and the absence of other concomitant signs and symptoms of infection. Matas also quoted Cottalorda, who advanced the theory that the lesion need not necessarily consist of a thrombus formation but that the vein may be held in a spastic state as a result of the irritation of the perisympathetic venous plexus. However, in the majority of cases, extensive thrombus of the vein has been found. The only case substantiating the theory of spasm was that reported by Cottalorda, who, on operation, found no thrombus but the vein in a spastic state.

PROGNOSIS

Prognosis as to life is good. The duration of the disability is variable. Patients may be completely restored in from one to two months and in many cases the convalescence is prolonged because of edema, weakness and stiffness of the arm. Recurrences are occasionally noted following exertion.

TREATMENT

In the acute stage the treatment consists of rest, elevation and hot moist packs locally. If there is residual edema, an elastic bandage may be applied spirally, beginning at the hand and extending upward to the shoulder. Diathermy is of value in reducing the swelling. In obstinate cases, excision of the thrombus or the entire segment of the thrombosed vein has been recommended. However, the advisability of such procedures is questionable, since after removal of the thrombus recurrence is likely, and if the venous segment is resected the chance for canalization of the organized thrombus is lost.

DIAGNOSIS

The diagnosis of primary axillary thrombosis is made on the following symptoms and signs:

1. Swelling of the arm and cyanosis within several hours or days after the accident, injury by strain or, occasionally, without any cause.

2. The absence of a rise in body temperature and absence of signs of local active inflammation.

3. The presence of dilated superficial veins on the affected arm and over the anterior part of the chest and also in the axilla.

4. The delay or absence in the collapse of the superficial veins of the upper extremity when the latter is raised above the heart level.

5. The presence of a cord in the axilla, which need not always be tender.

6. The increase of the venous pressure in the affected extremity.

7. Prolongation of the circulation time in the affected arm.

8. X-ray visualization of new collateral formation, enlargement and dilatation of the veins, evidence of stasis, on injection of radiopaque dyes into the veins of the affected arm, and the failure of the axillary vein to be visualized.

9. The presence of numerous superficial veins on the affected side as shown by photography with the infra-red technic.

224 East Fifteenth Street.

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13. Gould, E. P., and Patey, D. H.: Primary Thrombosis of the Axillary Vein, Brit. J. Surg. **16**: 208-213 (Oct.) 1928.

NICOTINIC ACID IN THE PREVENTION OF PELLAGRA

A PRELIMINARY NOTE

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AND
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As a natural sequel to the discovery that nicotinic acid is highly effective in the cure of canine blacktongue [1] and in the rapid relief of part at least of the syndrome of human pellagra,[2] it was determined to test the potency of this substance as a preventive of relapse in known pellagrins. The present report deals with observations made on a group of such individuals under reasonably adequate control.

METHOD AND MATERIALS

Subjects.—Thirty-three patients were chosen from the files of an outpatient pellagra clinic which is conducted annually from March 1 to December 1 and which has some 350 clients. Only persons known to have had severe pellagra in previous years and showing definite symptoms of relapse on March 9, 1938, were selected for the experiment. Sixteen persons were given nicotinic acid; the remaining seventeen constituted a control group and were given the customary ration of brewers' yeast. No attempt to modify the diet or environment was made in any case, since it seemed obvious that the diet used by these people was productive of pellagra. Two men were chronically alcoholic; all other patients were typical endemic pellagrins. The data regarding age, race, sex, number of previous attacks of pellagra and the severity of presenting symptoms are summarized in tables 1 and 2.

Dosage.—No information was available regarding the amount of nicotinic acid necessary to prevent the recurrence of pellagra. It was decided to try the effect of 100 mg. given twice a week. Dr. Spies [3] at the time concurred in the idea that this amount might be effective. The control group was given dried brewers' yeast 90 Gm. daily, the amount employed as a routine for prevention in this clinic.

Control.—All patients were seen on Wednesday of each week by an experienced observer, who noted the progress of all symptoms and signs and dispensed nicotinic acid in capsules containing 100 mg., one to be taken on Thursday and Monday of each week. All observations were made by the same individual. Treatment was begun March 16, 1938, and continued until April 27, 1938, when this experiment was terminated.

Materials Used.—Nicotinic acid was the crystalline preparation of the Eastman Kodak Company; brewers' yeast was Fleischmann's product, furnished by the American Red Cross.

From the University of Georgia School of Medicine and the University Hospital.

Invaluable aid was given by the local chapter of the American Red Cross in the conduct of the Pellagra Clinic and the provision of yeast and a portion of the nicotinic acid used in this study.

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3. Spies, T. D.: Personal communication to the authors.

RESULTS OF TREATMENT WITH YEAST

The comparison of results in the two groups can best be made by reference to the tables. It is apparent that the majority of patients studied were in age groups in which senile and arteriosclerotic changes may have contributed largely to the occurrence and persistence of mental symptoms. Frank neurologic disturbances were not observed. It is also obvious that the group treated with nicotinic acid was composed of persons who had suffered more frequent attacks of pellagra than most of the controls. Some degree of glossitis persisted in all but one of the patients given yeast but their general improvement was satisfactory, none regressed and all showed marked subjective as well as objective relief with restoration of appetite and gain in strength and weight.

RESULTS OF TREATMENT WITH NICOTINIC ACID

In the group treated with nicotinic acid there were interesting variations. During the first two weeks improvement of glossitis and of appetite were noted in all, the changes in the appearance of their tongues being more striking than in the controls. After this time the progress of different individuals was most irregular. Patient 10 continued to improve; he was a chronic alcoholic addict and was frightened into complete sobriety. Patients 1, 2, 6, 7, 8, 11, 12, 14 and 16 improved in all respects for four weeks and then showed recurrence of glossitis with gradual loss of appetite and strength, so that their condition at the end of the sixth week was not appreciably different from that at the beginning of treatment. Patient 4 was much better during the third and fourth weeks with good appetite, regeneration of lingual papillae and resolution of dermatitis; during the last two weeks there was loss of appetite, recurrence of nervousness and weakness and dermatitis of the nose; the tongue remained good. The remaining five patients, 3, 5, 9, 13 and 15, began to show definite signs of relapse during the fourth and fifth weeks, glossitis recurred in all, and diarrhea

TABLE 1.—*Results of Treatment with Yeast*

						Before Treatment						After Treatment					
Number	Initials	Previous Attacks	Age	Race	Sex	Glossitis	Stomatitis	Dermatitis	Diarrhea	Loss of Weight	Mental Symptoms	Glossitis	Stomatitis	Dermatitis	Diarrhea	Loss of Weight	Mental Symptoms
1	E. L.	1	71	W	♀	2	1	1	2	0	1	1	0	0	0	0	1
2	E. P.	1	58	W	♀	3	1	0	1	1	2	1	0	0	0	0	0
3	S. W.	1	66	W	♀	2	0	0	0	0	2	1	0	0	0	0	1
4	G. E.	3	63	W	♂	1	1	0	0	1	3	1	0	0	0	0	1
5	O. S.	1	50	W	♀	3	1	0	0	0	3	2	0	0	0	0	1
6	M. P.	1	58	W	♀	2	1	0	0	1	0	1	0	0	0	0	0
7	M. B.	20	91	W	♀	2	1	2	0	0	3	1	1	1	0	0	2
8	L. S.	9	45	W	♀	1	0	0	0	1	1	0	0	0	0	0	1
9	M. F.	2	36	W	♀	2	1	0	1	2	2	1	0	0	0	0	1
10	H. G.	1	49	W	♂	3	2	1	0	2	4	1	0	0	0	0	1
11	M. R.	1	49	W	♀	2	1	0	0	0	3	1	0	0	0	0	1
12	E. S.	1	49	W	♀	2	0	0	0	1	3	1	0	0	0	0	1
13	E. H.	3	47	W	♀	2	0	0	0	1	2	1	0	0	0	0	0
14	L. D.	2	35	C	♀	3	1	0	0	0	0	1	0	0	0	0	0
15	M. B.	1	69	W	♀	2	1	1	0	1	0	1	0	0	0	0	0
16	O. A.	4	65	W	♀	2	2	1	0	0	1	1	0	0	0	0	1
17	S. R.	2	55	C	♂	4	2	0	2	1	1	1	0	0	0	0	0

Summary of results obtained in patients treated with 90 Gm. of brewers' yeast daily from March 16 to April 27, 1938. The figures in the columns under the signs and symptoms listed indicate severity: 1, mild; 2, moderate; 3, severe; 4, very severe.

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appeared and became severe in case 9. The other four lost appetite, weight and strength and patient 13 became severely demented and was hospitalized.

The tables, which record the condition of the two groups at the beginning and end of treatment, do not reflect the rather dramatic early improvement and later regression of the patients treated with nicotinic acid. A factor which cannot be neglected is the actual food value of the yeast given the control group as well as the possible effect of the vitamin B_1 and various fractions of B_2. The addition of somewhat over 300 calories, including approximately 40 Gm. of protein of good biologic value, to the daily ration of these people is important. The nicotinic acid content of the daily dose of yeast was probably about 15 mg.

SUMMARY AND CONCLUSIONS

1. Thirty-three known chronic pellagrins were selected from a large number applying for preventive treatment. Sixteen were treated with nicotinic acid given in doses of 100 mg. twice weekly; seventeen were used as controls and given 90 Gm. of brewers' yeast daily. The observation period was six weeks.

2. In the group treated with nicotinic acid only one patient showed definite improvement at the end of the period. Nine improved for about four weeks and then regressed to about the same status as at the start of the experiment. One patient after good early response was slightly worse at the end, while five who also showed much gain during the first two weeks of treatment were definitely in relapse at the end of the sixth week.

3. In our hands nicotinic acid in doses of 100 mg. twice a week has not been effective in preventing relapse in known chronic pellagrins.

4. From experience in the treatment of acutely ill patients we feel that it is likely that a small daily dose of nicotinic acid may prove more effective or even entirely satisfactory. It is unlikely, however, that nicotinic acid without some improvement in the diet will prevent relapse indefinitely in chronically malnourished individuals.

TABLE 2.—*Results of Treatment with Nicotinic Acid*

						Before Treatment						After Treatment					
Number	Initials	Previous Attacks	Age	Race	Sex	Glossitis	Stomatitis	Dermatitis	Diarrhea	Loss of Weight	Mental Symptoms	Glossitis	Stomatitis	Dermatitis	Diarrhea	Loss of Weight	Mental Symptoms
1	C. J.	3	51	C	♀	1	0	2	1	1	0	1	0	2	0	2	0
2	W. B.	2	54	W	♂	1	0	1	0	0	1	1	0	1	0	1	1
3	M. A.	5	59	W	♂	2	0	0	0	0	1	3	1	2	0	2	2
4	J. A.	3	50	W	♀	1	0	1	0	0	1	3	1	2	0	2	2
5	I. M.	3	58	W	♀	3	1	1	0	0	2	4	2	1	0	2	2
6	B. R.	4	50	C	♀	1	0	0	0	0	1	2	0	0	0	1	2
7	S. F.	9	66	W	♀	1	0	0	0	0	1	1	0	0	0	0	1
8	W. S.	8	58	W	♂	1	0	1	0	0	2	2	0	2	0	1	2
9	R. M.	1	41	W	♀	2	0	0	0	0	0	3	1	0	2	3	1
10	H. C.*	1	43	W	♂	1	1	0	0	0	2	0	0	0	0	0	1
11	F. W.	3	47	C	♀	2	0	2	0	1	2	2	0	2	0	1	2
12	M. S.	2	42	W	♀	1	0	0	0	0	1	1	0	0	0	0	1
13	E. P.	2	62	W	♀	3	2	2	2	1	2	4	3	2	2	2	2
14	E. B.	7	51	W	♀	1	0	2	0	2	2	1	0	1	0	1	1
15	H. B.*	1	53	W	♂	1	0	3	0	0	0	2	0	4	0	2	0
16	I. W.	12	66	W	♀	3	1	0	0	0	0	2	1	0	0	0	0

Summary of results obtained in patients treated with 100 mg. of nicotinic acid twice weekly from March 16 to April 27, 1938. The figures in the columns under the signs and symptoms listed indicate severity: 1, mild; 2, moderate; 3, severe; 4, very severe.

* indicates chronic alcoholism.

Clinical Notes, Suggestions and New Instruments

POSTMORTEM CESAREAN SECTION IN TWIN PREGNANCY WITH DELIVERY OF TWO LIVING BABIES

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Since there are so few reports of twins in the literature, it occurred to us that a brief report of the case here reported might be of interest. At the present writing we have been unable to find another report in which twins delivered by postmortem cesarean section have lived for any length of time.

Postmortem cesarean section is one of the oldest practices in obstetrics. Even the old Roman law of Numa Pompilius, the Lex Regia of 715 B. C., decreed that no pregnant woman should be buried until her child had been removed from her womb. Ancient mythology referred to the birth of Bacchus and Aesculapius in this manner. There are laws in the Talmud and of the Roman Catholic church making this imperative.

Of all the postmortem sections done, until comparatively recent times very few living babies have been delivered.

Schops [1] reported statistics on a series of 107 cases from 1836 to 1846 in which not a single living child was extracted. He also reported another series of ninety cases from 1852 to 1868 in which there was no living child. Bohmer [2] has reported a series of cases in which only 60 per cent of the deliveries were of living babies. Pfaff reported fifty-two cases with twenty-two living children and thirty dead. Schwarz reported 107 cases in 1862 in which there was no living child. In 1914 Hallman collected sixty-eight cases from the literature in only from 61 to 68 per cent of which were there deliveries of living babies. Harrar,[3] in reporting his ten cases of postmortem section, reports that three babies were stillborn, five were born alive but died in a short time, one baby was born alive but died on the sixth day of pneumonia, and the last two were living babies and were discharged from the hospital in good condition. In one of his cases there was a twin pregnancy; both babies were born alive but died in about twenty minutes.

Yule [4] in 1926 reported a twin pregnancy in which the first fetus was delivered dead and the second, about ten minutes later, was extracted and lived.

Numerous other cases have been reported in the recent literature, in most of which the baby has lived. The following are only a few of the reports:

Hoffman [5] in 1935 reported a case of a section done on a woman dying of convulsions, in which a live baby was delivered.

Roberts [6] in 1925 also reported a case in which a woman died in a convulsion, with delivery of a living baby.

Phaneuf [7] says that he has delivered three living babies by postmortem section.

Fallon [8] in 1926 reported two cases in which delivery of living babies took place, both mothers having died of eclampsia.

Rider [9] reported a case in 1931 in which the baby lived.

Campbell and Miller [10] reported a case in 1931 in which a living baby was delivered.

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8. Fallon, M. F.: Cesarean Section After Death of Mother, Boston M. & S. J. **195**: 929 (Nov. 11) 1926.
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10. Campbell, A. M., and Miller, J. D.: Postmortem Cesarean Section: Report of Case with Living Child, J. Michigan State M. Soc. **30**: 923-927 (Dec.) 1931.

Rosin [11] also reported a case in 1927 in which a section was done fifteen minutes post mortem and the child lived.

Holden [12] reported a case in 1932 in which a primipara died in convulsions and a postmortem section was done, saving the life of the fetus.

There are a few factors of importance that determine the possibility of extracting a living child. The main one of these is the element of time. De Lee [13] has stated that a fetus will live if delivered from five to twenty minutes after the death of the mother. Hallman [2] states that the prognosis is better for the child in "sudden, rapid and violent death, disease of the central nervous system, heart and kidneys, than after long continued or infectious diseases, diseases of the blood, or intoxications in which the blood is altered."

The question of civil or criminal responsibility is to be thought of by any physician who performs a postmortem cesarean section without the consent of the husband or next of kin. This question is still one of controversy and has not been firmly settled. Reichmann, however, makes this statement:

"I cannot escape the conclusion that, given a case in which, in the light of existing scientific knowledge, the belief is reasonably justifiable that the infant may be rescued and its life saved, a cesarean section will be justified by the law on grounds of public policy and the person performing the same will be fully protected, both civilly and criminally, though performed without consent, or even against the protest in those in whom the law has recognized a legal right to the possession of the body of the deceased, provided, of course, the operation be performed in good faith and with due skill and without unnecessary injury or mutilation."

Other legal authorities have fairly well agreed that there is neither a civil nor a criminal violation in doing a postmortem section, even without the consent of the next of kin. Bacon even made this statement: "The obligation to save the human fetal life, when it can be done without destroying or seriously jeopardizing another life, is absolute."

A few authorities are of the opinion that this procedure is usually distasteful to all concerned, but most of them are of the opinion that the physician is morally obligated to do all possible in trying to save fetal life after the death of the mother.

REPORT OF CASE

Mrs. D. C., aged 41, an octipara, presented herself at our office about 11 a. m., Aug. 31, 1937, because of shortness of breath, which was so marked that she had been unable to sleep for the past two weeks unless she was sitting upright. She was pregnant—almost at term—the estimated date of confinement being about September 15. Her youngest child was 5 years of age, and she stated that she had had no trouble with any of her previous pregnancies. She had an increasing amount of edema, which had begun in her feet and legs four or five weeks before and had become so marked that it extended upward to the lower part of the chest. On hurried examination (the woman was quite dyspneic and it was our intention to hospitalize her as soon as possible) these significant observations were made: Both lower extremities and the abdomen were enormously distended with edema; she was very uncomfortable because of the shortness of breath; her facial expression was typical of that of patients with advanced heart disease who have become decompensated. The cardiovascular system showed a pulse rate of from 90 to 100, which was bounding and full with a moderate sclerosis of the radials. The blood pressure was 190 systolic and 110 diastolic, and every valve was apparently incompetent. There was a great deal of hypertrophy and dilatation. Moist rales were present in the base of both lungs. There was so much edema of the abdominal wall that it was impossible to make out anything definite on palpation of the abdomen. The impression was that the condition was hypertensive heart disease which had become decompensated because of the added load of the pregnancy. She was hospitalized immediately and orders were left for the administration of morphine for rest and four 1½ grain (1 Gm.) tablets of powdered leaf digitalis every six hours for twenty-four hours. Her weight was about 180 pounds (81.6 Kg.).

At about 5:30 p. m. we were informed that the patient had just had a severe heart attack. We reached her bedside in about fifteen minutes and found her unconscious, pulseless, with frothy fluid exuding from the nose and mouth. She undoubtedly had a severe acute failure on the left side. The pupils had already become dilated and respiration was only in gasps. Epinephrine, caffeine and pyridine betacarbonic acid diethylamide (coramine) were administered without effect. We did everything possible for the next ten minutes, including artificial respiration. Dr. Carrithers was present and when her heart sounds became inaudible one of us (D. A. H.) took the scalpel and immediately opened the abdomen and uterus. A boy was extracted with a weak cord pulsation of about 60 per minute. After two or three minutes, during which time efforts were being made to resuscitate him, there was a weak cry, and he was in fair condition. I turned to inspect the abdominal wound and noticed the arm of another fetus in the uterus, which was full of amniotic fluid. A baby girl was quickly extracted and found to have a cord pulsation of between 30 and 40 per minute and very weak. This was approximately seven or eight minutes from the time the woman was pronounced dead and about thirty-five minutes from the beginniing of the patient's acute attack, during which time she had been practically pulseless. After about forty-five minutes' work at resuscitation, during which time alpha-lobeline and caffeine with sodium benzoate were administered in large doses and prolonged mouth to mouth insufflation was instituted, the girl uttered a weak cry. The twins were placed in the incubator for about eighteen hours, after which time they were in fair condition. After a stormy period of about a week the little girl's condition became fairly good. The birth weight of the boy was 4 pounds 4 ounces (1,928 Gm.) and the girl's was 5 pounds 6 ounces (2,439 Gm.). At the present time both are perfectly normal infants and in good condition. The boy weighs 13 pounds 8 ounces (6,123 Gm.) and the girl weighs 12 pounds 10 ounces (5,728 Gm.).

112 North Sixth Street.

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TUMOR IN ABDOMINAL WALL FROM A PINE NEEDLE SWALLOWED SEVERAL YEARS PREVIOUSLY

HARRY L. SMITH, M.D., AND JAMES T. PRIESTLEY, M.D.
ROCHESTER, MINN.

A white man, aged 40, whose family history was not significant, underwent a tonsillectomy in 1925, a stone was removed from his left kidney in 1926, and he had a sore throat in 1935; otherwise the medical history was essentially negative. In July 1937 he noticed slight soreness in the right groin. This remained for a few days and then disappeared. In August he again noticed a slight soreness in the same region. He applied an ice bag and the soreness disappeared in a few days. In November 1937, soreness and stiffness developed in the right lower quadrant of the abdomen. Since it came on a day after playing baseball, the patient attributed the pain to this. At this time he first noticed a hard lump just above the crest of the ilium. Because of this lump the patient then consulted a physician and several roentgenograms were taken. These were negative. The patient came to the clinic Jan. 13, 1938.

On admission the patient was well developed and well nourished and did not appear ill. Physical and laboratory examinations gave essentially negative results except for a hard mass in the right lower abdominal quadrant. Just above and medial and apparently fixed to the iliac crest was a stony mass about 6 cm. in diameter. This mass felt like a bony tumor; it was not tender. Many roentgenograms were taken but none revealed any involvement of bone. It was first believed that this tumor was a chondroma, since chondromas often do not produce a roentgenologic shadow.

At exploratory operation, January 19, a hard fixed mass was found just medial to the right anterior-superior spine of the ilium. The tumor was exposed by cutting through the external

From the Section on Medicine (Dr. Smith) and the Division of Surgery (Dr. Priestley), the Mayo Clinic.

oblique muscle. While hard, the tumor appeared to be inflammatory, which fact was confirmed by the pathologist. Deeper dissection into the center of the mass exposed an old pine needle, which measured about 4 cm. in length. This was removed and several small sinus tracts surrounding the pine needle were curetted. The wound was left entirely open, packed with iodoform gauze and permitted to heal by granulation. Convalescence was uneventful.

After operation, additional information was obtained. The patient was found to have worked for a lumber company from 1926 to 1929. During this period he was out in the woods most of the time. On his daily horseback rides through the woods he would often pick pine needles from the trees and, placing one in his mouth, chew on it. This had become quite a habit. He did not, however, remember having swallowed a pine needle.

Evidently this patient had swallowed a pine needle some time between the years of 1926 and 1929 and it had worked through the intestinal wall without producing any noticeable symptoms. There were no symptoms until a few months prior to operation, when an inflammatory reaction developed around the needle, but even then the symptoms consisted only of slight soreness in the side. It was because of this soreness that the mass was finally discovered.

THE ACOUSTICS OF THE STETHOSCOPE

DOUGLAS MACFARLAN, M.D., Philadelphia

The considerable number of variously designed stethoscopes on the market would lead one to judge not only that there is much difference in taste but that there is probably a difference in quality. More than this, it would seem important for one to know something about the variability introduced by an instrument for the examining of acoustics and something about the sounds to which one is listening.

TABLE 1.—*Normal Heart Sounds (After Williams and Dodge)*
Frequency Distribution in Energy Percentage

Frequency	Energy
50- 60	56%
60- 70	28%
70- 80	10%
80- 90	4%
90-100	2½%
100-110	1%

Above these frequencies the intensities are negligible.
Low pitched heart murmurs contain as their characteristics frequencies below 400 cycles.
High pitched murmurs range from 120 cycles to 660 cycles.
Presystolic murmurs lie for the most part below 140 cycles but may contain characteristics up to 400 cycles (Cabot and Williams).
Diastolic and systolic murmurs range chiefly between 120 and 660, occasionally ascending to 1,000 cycles.
The pericardial rub contains frequencies between 140 and 660 cycles.
Rales lie between 120 and 1,000.
Amphoric breathing ranges between 240 and 660 cycles.
Bronchial breathing ranges between 240 and 1,000 cycles.

The intensities of the sounds of the heart and the chest [1] are very small, not averaging, for the frequencies they possess, more than 10 decibels in their greatest exaggerations. The frequency characteristics of these various sounds are contained in a very narrow band between 60 and 1,000 cycles. In other words, whereas the normal hearing range lies roughly between 64 and 26,000 cycles, for listening to chests and hearts one is required to have good hearing only in the zone 64-1,000. Yet a small hearing loss in this restricted area will make the usual heart and chest sounds inaudible.

One factor of much importance in auscultation is a quiet examining room, for it requires only a small amount of outside noise to dampen out the sounds one wishes to hear.

It is also important to remember that hearing is greatly reduced by any (even slightly) increased pressure of the air column on the drum. Thus, tightly fitting ear tips held in place by strong springs will cut down efficiency.

It is apparent that, the larger the area of the stethoscope piece in contact with the chest, the greater the amount of sound collected; thus the diphragm types when large collect more sound than the smaller "bell" types. Yet the latter have an advantage in more closely localizing the spot of greatest loudness. It will perhaps be a surprise to learn that the unaided ear operates at greater efficiency than the ear aided by any type of stethoscope. A "frequency hearing run" of nine stethoscopes bought in the open market showed that for the most part sounds were not magnified but reduced in audibility. Table 2 shows in decibels the gain (+) or reduction (—) in hearing of these middle range pitches. It might appear from this that the best policy would be to buy the least expensive stethoscope one can find and then not use it. In this connection it is interesting to recall that David Livingstone was nearly "plucked" for his medical degree because he considered the stethoscope of doubtful use. But localization of sound is often of great importance, and the small bell stethoscope can best do this.

TABLE 2.—*Frequency Response of Nine Different Stethoscopes in Terms of Decibel Gain or Loss in Loudness*

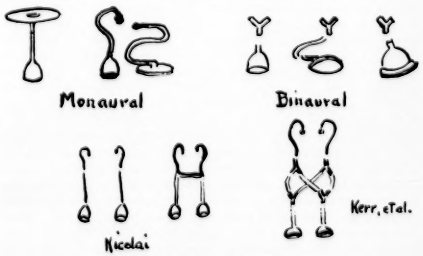
Frequency	128	256	512	1,024
No. 1 diaphragm type	—10	— 5	0	— 5
No. 2 diaphragm type	+10	— 5	—10	— 7
No. 3 diaphragm type	0	0	— 5	—10
No. 4 Bell type	0	0	+ 2	— 5
No. 5 Bell type	+ 5	+10	— 5	—10
No. 6 Bell type	+ 5	0	— 5	— 5
No. 7 Bell type	—25	—15	—25	—20
No. 8 Bell type	0	0	— 5	— 5
No. 9 Bell type	— 5	— 5	—10	— 5

The most careful localization, however, can be done by using the phase difference phenomenon first expounded by Nicolai and later by English investigators, and in this country by Halverson, Stewart, Bunch and Seashore.[2] Such studies were developed by the war time necessity of submarine detection. In 1937 Kerr, Bassett, Goldman and Althausen of the University of California developed the idea in a double stethoscope, the symballophone.[3]

In using this method of localization it is necessary that the examiner hear equally well in the two ears. Very small differences in intensity can be detected.

QUALITY

No instrument can improve on the unaided ear against the chest to appreciate the subtle qualities of the sounds of the heart and the chest. The examiner's "opposite" ear must, of course, be stopped up. Unfortunately, the configuration of the chest makes it difficult for the unaided ear to localize sound in small areas.



Types of stethoscopes.

Conduction of sound in the chest depends on the factors of flesh and bone. An adipose chest wall or extensive fatty breasts will surely absorb much of the sound. The stethoscope, fol-

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2. Halverson, Stewart, Bunch and Seashore: Iowa University Studies, 1922.

3. The symballophone was presented in the Scientific Exhibit of the American Medical Association in Atlantic City, N. J., in June 1937.

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lowing along the prominence of the ribs, will often be misleading as to the direction of transmission of sound.

For those physicians with impaired hearing, the advent of the crystal microphone has made it possible for them to feel that auscultation, with all its importance, is not in the discard. This type of microphone is extremely free of distortion.

Amplification, however, is neither practical, nor desirable, nor is it needed for the physician with normal hearing.

1805 Chestnut Street.

OXYGEN SATURATION OF ARTERIAL BLOOD IN THE CYANOSIS FROM SULFANILAMIDE

FREDERICK H. KING, M.D., AND ALAN LESLIE, M.D., WITH THE TECHNICAL ASSISTANCE OF GRACE BYRNE, NEW YORK

A majority of the patients to whom sulfanilamide is administered in large doses show cyanosis in varying degree. This has been attributed by various authors to decreased oxygen saturation [1] methemoglobinemia [2] and sulfhemoglobinemia.[3] Although the latter two may occur in some cases, they do not assume a principal role in most instances, as has been demonstrated by Marshall and Walzl.[4]

We have investigated the oxygen saturation of the arterial blood in eight patients to whom sulfanilamide was administered in fairly large doses. In each instance there was a grayish blue cyanosis during the administration of the drug. In no instances were there any clinical manifestations of anoxemia. Blood specimens, withdrawn for analysis, were uniformly dark.

Blood was drawn from the brachial artery under anaerobic conditions and collected under oil, following which the determinations were promptly made. The oxygen content and capacity of the blood were determined by the methods of Van Slyke and Neil.

Observations in Eight Cases

Case	Diagnosis	Date	Cyanosis	Total Dosage of Sulfanilamide to Date	Hemoglobin, per Cent (Sahli)	Oxygen Content, Volumes per Cent	Oxygen Capacity, Volumes per Cent	Oxygen Saturation, per Cent
1	Acute infectious arthritis	2/ 9/38	+++	19.3 Gm., 2/6 to 2/9	72	14.8	15.9	93.1
		2/14/38	+	20 Gm. discontinued 2/9	65	13.3	14.8	89.8
2	Mitral stenosis	2/16/38	++	10 Gm., 2/14 to 2/16	75	14.5	16.2	89.5
3	Postabortal sepsis, diabetes mellitus	2/18/38	++	7 Gm., 2/17 to 2/18	60	10.7	11.3	94.7
4	Acute infectious arthritis	2/24/38	+++	13 Gm., 2/22 to 2/24	82	14.7	16.2	91.0
		2/25/38	++++	18 Gm., 2/22 to 2/25	..	13.2	14.9	88.2
5	Lobar pneumonia	2/26/38	±	.....	87	18.7	19.5	96.1
		2/28/38	++	13 Gm., 2/26 to 2/28	85	14.9	16.8	88.7
6	Ureteral calculus, bronchopneumonia, left lower lobe	3/ 2/38	++	12 Gm., 2/28 to 3/2	68	12.3	14.3	86.0
7	Hemolytic streptococcus meningitis	3/23/38	++++	30.64 Gm. and prontosil, 20 cc., 3/17 to 3/23	70	10.4	11.4	91.2
8	Hemolytic streptococcus meningitis	3/24/38	+++	37.24 Gm. and prontosil, 240 cc., 3/16 to 3/24	62	10.8	11.9	90.8

The accompanying table discloses the fact that in no instance was the oxygen saturation of the arterial blood at a point low enough to explain the relatively marked cyanosis. In cases 4 and 7 the cyanosis was the most marked in this series and the initial determinations revealed oxygen saturations of 91 per cent and 91.2 per cent. Repeated determinations in several instances showed a fall in both oxygen content and capacity. The factors responsible for the decreases cannot be evaluated from so small a group of cases. The percentage of oxygen saturation, however, never fell to a point to warrant considering it a significant causative factor in the cyanosis.

The observations made on this group of eight patients would tend to indicate that diminished oxygen saturation (increased unsaturation) of the arterial blood does not play a significant role in the cyanosis from sulfanilamide. This is in keeping with the clinical observation [2] that the administration of oxygen in these cases fails to influence the cyanosis.

111 East Seventy-Fifth Street.

Aided by a grant from the Linde Air Products Company.

From the Medical Services and the Laboratories, the Mount Sinai Hospital.

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AN OUTBREAK OF JAUNDICE IN DETROIT

PRELIMINARY REPORT

JOSEPH G. MOLNER, M.D., AND JOSEPH A. KASPER, M.D.
DETROIT

Following the recognition of a disease characterized by fever and jaundice by Weil in 1886, series of similar cases were reported by other investigators. Inada and Ido and their associates [1] in 1914 described the same malady as it occurred in Japan, and after careful investigation these workers concluded that the etiologic agent was a spirochete. Other cases were reported by workers from England, Germany, France and the Netherlands. Particular attention in most of these reports is directed to the significantly high incidence of the disease among soldiers in trenches.

Noguchi [2] in 1917 described the organism isolated in cases of jaundice in greater detail. He classified it a Leptospira icterohaemorrhagiae. In a later publication of his studies he reported finding virulent strains of Leptospira in carcasses of rats trapped in New York. These organisms were found to be pathogenic to guinea pigs and agreed in immunity and agglutination reactions with the Japanese strain isolated by Inada and Ido and their associates. Repeated isolations of similar strains of Leptospira from rats were reported by Jobling and Eggstein,[3] Langworthy and Moore [4] and others.

Weil's disease is most generally encountered as a sporadic disease, occurring primarily in localities that are heavily infested with rats. Another common environmental association with this disease includes moist or muddy conditions. Persons working under such conditions as, for example, miners, sewer workers, fish cutters, bargemen, butchers and garbage handlers are most prone to acquire the disease. These environmental conditions may account for the greater incidence among men.

Outbreaks of jaundice in civil populations have been reported in England [5] and in the United States.[6] The distinguishing feature of such attacks, as compared to Weil's disease, was the apparent insidious nature of their onset and the tendency to

From the Department of Health.

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occur in outbreaks. Epidemic jaundice primarily affects children and occurs more generally during the fall and early winter months. Its clinical course usually extends over a period of about two weeks. Moderate hyperpyrexia is usually noted, and seldom does the illness terminate in death. The etiology of this type of jaundice is unknown, although it has been postulated by some investigators that a strain of spirochetes of low virulence, or possibly a filtrable virus, may be the causative agent.

In the early part of January 1938 our attention was called to a sudden increase in the incidence of jaundice among school children. A group of five patients were suffering from a moderate form of this disease. In rapid succession, and in the same locality, our attention was called to twelve additional cases, one of which was fatal. By investigation of the current cases and by retrospective inquiry, which included the period extending back to November 1937, we have been able to uncover a total of forty cases. One of the patients was a boy aged 3, another was a youth aged 16, and still another was a man. The remaining thirty-seven cases were distributed in the age group from 5 to 15 years.

There was a very definite aggregation of cases noted in this group. The majority of the cases were reported from the west side of Detroit. The localities primarily involved were the far north, far south and central areas of the west side of Detroit. Twelve cases were reported from one elementary school. Multiple cases have occurred in five families.

The condition apparently is infectious in nature, and person to person contact may play an important role in the transmission of the disease. In 60 per cent of instances contact with other cases was established.

Two outbreaks of jaundice in kennels have been investigated. Curiously, both of these outbreaks occurred in the late fall of 1937 and in localities where, at the present time, human cases are showing evidences of aggregation. In both of the kennel outbreaks infestation with rats was noticed by the proprietors. The outbreak of jaundice among the dogs affected animals under 6 months of age. The case fatality among these was 50 per cent. One of the kennel outbreaks was superficially investigated, and liver scrapings from two of the dead animals revealed the presence of organisms having the structure of spirochetes. These observations, however, were not followed by inoculations of guinea pigs.

In another instance, again in the section of the city in which human cases show evidences of aggregation, there is the history of a fox terrier having been bitten by a rat. The history was definite and verified. The dog, three days after injury, became ill with nausea, vomiting and loss of appetite. On the fifth day of illness frank jaundice, clay-colored stools and dark urine were noted by the owner. The dog failed to take food from the fourth day of onset of his illness and died on the eighth day of the disease. The observations at autopsy, performed two weeks after death, were petechial hemorrhages throughout the mesentery, liver and lungs, together with definite signs of jaundice. These observations, however, were obscured by autolytic changes that had developed.

Our investigation of the fatal case—the 3 year old boy—shows that the disease was ushered in with a chilly sensation but no definite chills, which was followed by fever. The temperature ranged from 99.6 to 103 F. Concurrently with the chilly sensation and temperature elevation nausea, vomiting, lethargy and loss of appetite developed. On the fourth day of illness coryza developed, at which time the patient was seen by a physician.[7] On the sixth day highly colored urine was noted, and on the seventh day frank jaundice developed. Within three days after the onset of the jaundice apparent recession of the symptoms was noted. Convalescence continued for five days, when it was interrupted by an acute exacerbation evidenced by the recurrence of the chilly sensation and the rise in temperature. Clinically the child became more acutely ill and died on the twenty-first day of his illness, after lapsing into terminal coma.

Antemortem and postmortem specimens of blood taken from the child revealed spirochetes on dark field examination. Liver scrapings were also found to contain spirochetes. Samples of blood and urine inoculated into guinea pigs failed to produce jaundice in these animals. The patient's blood serum showed agglutination of Leptospira icterohaemorrhagiae in a dilution of 1:30,000, which was reported and considered diagnostic by the National Institute of Health.

Probably one of the most intriguing circumstances in the course of our investigation arose in the follow-up of the foregoing case. The first case of jaundice in a dog was encountered in a Scotch terrier owned by this family. The dog became ill about fourteen days prior to the onset of the child's illness. The dog's illness was characterized by nausea, vomiting, listlessness and loss of appetite. Within two days clay colored stools and highly colored urine were noted. A veterinarian was consulted and the condition was diagnosed as jaundice. Although the animal's condition was considered hopeless, convalescence was surprisingly uneventful and the dog was returned to the owner in ten days. It was within the following two days that the child in this family became ill.

7. This case was reported to the department of health by Dr. Edgar E. Martmer.

SUMMARY

An outbreak of jaundice has been noted among children and adults in Detroit.

The causative agent in this outbreak is as yet undetermined. Agglutination of Leptospira icterohaemorrhagiae in a titer of 1:30,000 was found in one case, which terminated fatally.

Jaundice among dogs was observed. In one instance the disease in the dog was followed by a similar malady in the owner.

Investigation reveals that contact of dogs with rats may be followed by jaundice in the former. Of six young dogs in which jaundice developed three died of the disease.

The observations here reported warrant further investigations relative to Leptospira icterohaemorrhagiae as the cause of jaundice in Detroit. Virus as a possible etiologic agent, as suggested by Bates,[5] might also bear investigation.

3919 John R. Street.

A FINGER SPLINT FOR EXTENSION OR FLEXION

NED SHNAYERSON, M.D., NEW YORK

This instrument is a device presented to obviate the difficulties one meets in the treatment of the "stiff finger."

When the patient presents a loss of function of the metacarpophalangeal or interphalangeal joint not due to ankylosis, one tries to overcome the fixed position of flexion or extension by

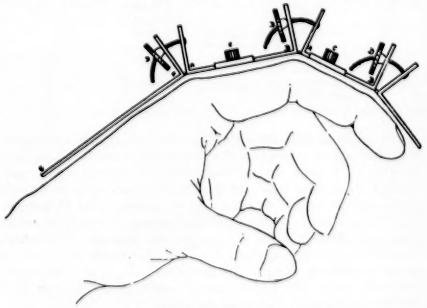

Fig. 1.—Splint for extension or flexion of finger.

a constant force in the direction desired. Many devices have been utilized to accomplish this, such as a plaster cast with overhanging surface so that felt pads may be wedged in between this surface and the fingers, and elastic bands applied to the end of the finger or finger nail. All these devices are usually cumbersome and apply an inconstant and inefficient force.

The device here presented is a metal splint which has a corresponding joint for each joint in the finger. In figure 1 the middle two segments *A-B* correspond to the two proximal

segments of the finger and can be lengthened or shortened, according to the patient's finger length, by a lock *C*. When the splint is fixed in place, the affected joint or joints can be flexed or extended into a constantly increasing or decreasing angle by turning the turn-screw *D*. The patient does this manipulation himself, so that the increase of flexion or extension is constantly applied and the angle desired more quickly

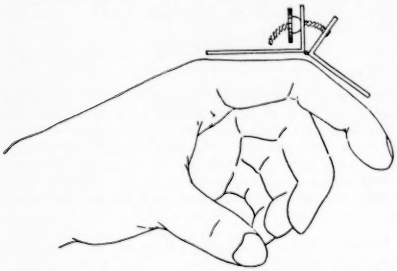

Fig. 2.—Use of part of splint when only one joint is affected.

obtained. This angle is held in position without any return to the old position for as long a period as is desired. The splint is applied by encasing the segment *E-F* in a plaster bandage around the hand. This will hold the instrument in a rigidly correct line. The middle segments are adjusted to the proper lengths and some padding is placed between the finger and the under surface of the splint. A turn of narrow adhesive plaster around the segments of the finger and the splint will complete the application of the instrument. If only one joint is affected, the splint can be taken apart and only the corresponding part applied to the affected joint (fig. 2).

Mr. Frank Smart cooperated and contributed the mechanical ingenuity required in overcoming the difficulties in making the joints of this device pass through a 90 degree span.

45 East Sixty-Second Street.

A CASE OF POLYCYTHAEMIA VERA: THE FAMILIAL INCIDENCE OF HEMOPHILIA AND TREATMENT WITH PHENYLHYDRAZINE

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In reviewing the literature pertinent to polycythemia, one sees no mention of the etiologic aspect of this disease. There is free mention of the pathology, therapy and sequelae, but no observations cast any light on the cause of this rare condition. I am offering no theory as to the mechanism which results in erythremia, but it is of more than passing interest to note the appearance of two rare hematologic diseases in the same family.

REPORT OF CASE

History.—B. G., a white woman, aged 60, a widow, a member of an old New England family, first seen in November 1935. For two months the patient complained of nausea, vomiting, weakness, dizziness, a throbbing sensation throughout the head, discoloration of various parts of the body, neuralgic pains of the muscles and joints, and a marked distention of the abdomen.

The past history revealed the average childhood diseases, with menstruation commencing at 14 years and the menopause at 40, with no menorrhagia or metrorrhagia at any time. Two female children were delivered normally with no severe postpartum hemorrhage; there had been no surgical operations at any time except extraction of all the patient's teeth in 1923, which caused oozing for several days. The patient's mother, as well as herself, bled more than the average when they cut their fingers doing housework.

About seventeen years before admission the patient noticed a lump in the left upper abdominal region, concurrent with purpuric spots over the body, cyanosis and frequent bilious spells. These attacks (occurring about five times a year) would last for about one week, incapacitating her, and appeared to be independent of menstruation.

In 1927 the patient had an episode similar to the present illness and was confined to bed for three months, at which time a diagnosis of polycythaemia vera was made; at that time she was given a monthly superficial x-ray treatment for the spleen for seven months. In 1930 her attending physician commenced monthly phlebotomies of an average of 25 ounces (750 cc.) for about one year. Since then she had kept growing progressively worse and for the last five years had spent the major part of the time in bed.

Figure 1 shows the incidence of hemophilia in the patient's family; the youngest sister died at the age of 35 of hemorrhages following a laparotomy, but, owing to inadequate records, neither the diagnosis nor the cause of the hemorrhages could be ascertained. All of the patient's cousins and nieces are in good health and free from any bleeding tendencies. The patient's husband died at the age of 65 from rectal carcinoma. Death certificates extending back thirty years failed to reveal any hemorrhagic tendencies in the patient's grandparents.

Physical Examination.—The patient was extremely cyanotic, weighing 92 pounds (41.7 Kg.), and appeared to be about 75 years old; she was roused with considerable difficulty. The entire face was cyanotic; the cheeks were very prominent; the orbital fossae were sunken; ophthalmoscopic examination showed marked distention of the retinal veins with peculiar bluish tinting of the retina; all the teeth were absent; the thoracic cage was symmetric, with marked prominence of the intercostal spaces. There was visible a pulsation in the region of the fifth interspace just beyond the midclavicular line. The heart was enlarged about 3 cm. beyond the midclavicular line in this interspace. There was an apical systolic murmur transmitted toward the left axilla. Blood pressure was 170 systolic, 100 diastolic. The liver was palpable, four fingerbreadths below the right costal margin; it was not tender and was smooth. The abdomen was full and was distended with considerable tympany. The spleen was mapped out, having its distal border slightly below the left anterior superior spine with its medial border crossing the midumbilical line. The spleen was smooth throughout and was moderately tender. No other viscera were palpable; the extremities were emaciated, and no abnormal

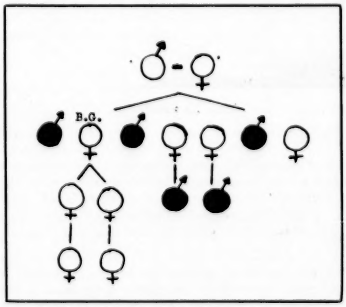

Fig. 1.—Familial incidence of hemophiliac deaths in B. G.'s family as indicated by the black figures.

neurologic manifestations were observed. Examination of the urine showed the specific gravity 1.014, with a faint trace of albumin.

Therapy.—Figure 2 shows the hematologic course of the disease under the influence of phenylhydrazine hydrochloride therapy, as recommended by Owen.[1] Levi [2] cautions against the use of this drug, since it may predispose to cirrhosis of the liver, yet I felt that if the patient were not treated she would

Read before the Bennington County Medical Society, Bennington, Vt., May 18, 1937.

1. Owen, Trevor: The Treatment of Erythremia with Phenylhydrazine, J. A. M. A. **85**: 2027 (Dec. 26) 1925.
2. Levi, E.: Erythremia, Ztschr. f. klin. Med. **100**: 777, 1924.

die. Furthermore, Ryle [3] is of the opinion that, since cirrhosis develops in the majority of untreated patients with erythremia if they escape other complications, it seems logical to conclude that their own inadequate method of destruction of blood is not necessarily successful.

Course.—The remission of the blood changes closely parallels the subjective symptoms. Blood pressure taken two months after the beginning of therapy fell to 155 systolic, 90 diastolic, and when last taken was 135/80. At present the patient is carrying on her full household duties and is assisting in chores. The last time she was seen the patient was doing a commendable job of papering the wall of her bedroom.

COMMENT

It would have been very illuminating to know whether this woman is a transmitter of hemophilia, but no male progeny have been borne to either of her daughters or to herself. It is to be expected that a male child would probably have shown

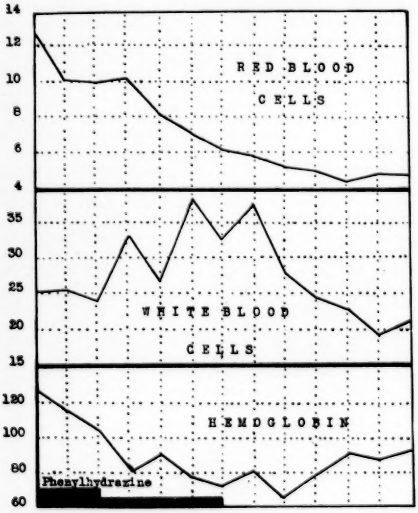

Fig. 2.—Hematologic response to phenylhydrazine therapy.

evidence of hemophilia. The hematologic manifestations in this case are far more severe than those usually found in this condition. Howell [4] states that when the red blood cells reach a level of 13,000,000 per cubic millimeter the viscosity of the blood will be such as to cause spontaneous thromboses.

CONCLUSION

In the case of severe polycythaemia vera presented here in which all male members of the patient's family died of hemophilia, a dramatic response was shown to phenylhydrazine hydrochloride therapy.

3. Ryle, J. A.: Erythremia, Guy's Hosp. Rep. **76**: 21 (Jan.) 1926.
4. Howell, W. H.: Textbook of Physiology, ed. 4, Philadelphia, W. B. Saunders Company, 1912, p. 412.

The Spirit of Medicine.—Descartes, in the sixteenth century, once said, "If ever the human race is raised to its highest practicable level intellectually, morally, and physically, the science of medicine will perform that ser.ice." I would substitute the word spirit for science, for it is, after all, the spirit of medicine that has sustained us.—Borzell, Francis F.: The Medical Profession and the Social Worker, *Pennsylvania M. J.* **41**:683 (May) 1938.

Special Article

VITAMIN A

PHYSIOLOGY AND PATHOLOGY

OTTO A. BESSEY, PH.D.
AND
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BOSTON

This article and others recently published or to be published comprise a new series on the present status of our knowledge of the vitamins. They have been prepared under the general auspices of the Council on Pharmacy and Chemistry and the Council on Foods. The opinions expressed are those of the authors and not necessarily the opinions of either council. Reprints are not available but the articles will be published later in book form.—ED.

Vitamin A is an essential part of the biochemical machinery of all vertebrates. It is a derivative of carotenoid pigments from plants. As far as is known, no vertebrate can synthesize carotenoids de novo.[1] Probably all higher animals can convert certain carotenoids to vitamin A. The pathologic consequences of the deficiency are similar in man, monkeys, cattle, swine, dogs, rabbits, guinea pigs, rats, mice and fowls.[2] For these and other reasons, facts about vitamin A learned from animal experiments are without doubt applicable to man.

The required brevity of this article will not permit mention of many papers and excludes critical discussions. The selection and evaluation of the material presented are expressions of our judgment. Readers wishing more references are referred to a monograph by Browning,[3] to a review by Robertson [4] and to the recent volumes of the *Annual Review of Biochemistry*.[5]

PHYSIOLOGY

Vitamin A and Carotenoids.—Fats, carbohydrates and proteins constitute the bulk of the physical basis of living matter and serve as the principal source of energy. Vitamins have to do with those biochemical mechanisms which are concerned with the transformation of food and energy into the many forms of activities essential to normally functioning organisms. Quantitatively the requirement for vitamin A is strikingly small; at most only a few milligrams daily are necessary for the largest mammals.[6]

Carotenoid pigments,[7] yellow and red compounds, are widely distributed in the plant world from bacteria and diatoms to garden fruits and vegetables. Four substances, out of this large group, are known at present from which animals can form vitamin A. These (provitamins) have been named alpha, beta and gamma

From the Department of Pathology, Harvard Medical School, and Harvard Dental School.

1. Wald, George: Carotinoids and the Visual Cycle, J. Gen. Physiol. **19**: 351 (Nov.) 1935.
2. Wolbach, S. B.: The Pathologic Changes Resulting from Vitamin Deficiency, J. A. M. A. **108**: 7 (Jan. 2) 1937.
3. Browning, E.: The Vitamins, Monograph 1 of the Pickett-Thomson Research Laboratory, London, Baillière, Tindall & Cox, 1931.
4. Robertson, E. C.: Recent Work on the Tissue Changes in Vitamin A Deficiency, Am. J. M. Sc. **192**: 409 (Sept.) 1936.
5. McCollum, E. V.: The Fat Soluble Vitamins, in Annual Review of Biochemistry, Stanford University, Calif., Stanford University Press **5**: 379, 1936. Sherman, Caroline C., and Sherman, H. C.: Vitamins, ibid. **6**: 355, 1937. Harris, footnotes 42, 51, 52 and 93.
6. Guilbert, H. R., and Hart, G. H.: Minimum Vitamin A Requirements with Particular Reference to Cattle, J. Nutrition **10**: 409 (Oct.) 1935.
7. Karrer, Paul: Nutritionally Important Natural Pigments, Helvet. chim. acta **19**: E33-E48, 1936.

carotene and kryptoxanthin. (A preparation of a carotenoid, echinenone, from the sex glands of sea urchins, has been found active as a provitamin A.) The chemical nature of these substances has been discussed in a previous paper of this series.[8] The term carotene will be used in this paper to represent the group of provitamins.

Carotene is obviously of great importance in the physiology of plants, though its exact function is unknown.[9] It usually appears concurrently with active growth and function and seems to be closely associated with chlorophyll in assimilative activities. Etiolated shoots contain little carotene while green shoots contain much, a fact that suggests the influence of light in the formation of carotene as well as of chlorophyll. In general, the quantity of chlorophyll is an index of the carotene content of green plants. Carotene does not seem to be consumed by any plant activity carried on in the dark, nor is it lost when the chlorophyll disappears at the time of yellowing of leaves. It is, however, completely destroyed in dry dead leaves. Rapid drying by artificial heat of freshly cut alfalfa destroys enzymes in the plant which in field curing are responsible for extensive inactivation of provitamin A. This fact is important because the carotene of green leaves is brought indirectly into human nutrition through milk and eggs. In human nutrition a considerable part of the vitamin A value, or activity, is represented by carotene in green and yellow vegetables.[10] Eggs, milk and butter are the usual sources of vitamin A but they also furnish some carotene, the proportions depending on the nutritional state of the hen and of the cow.

Except as a precursor of vitamin A, carotene as such is not known to be active in the animal economy. However, the problems of absorption, assimilation and storage of carotene and the relationship of carotene to the secretion of milk and the production of eggs must be considered in any discussion of the physiology of vitamin A.

Storage of Vitamin A in the Body.—Most animals have a remarkable capacity for the storage of vitamin A, illustrated by the fact that a rat may in a few days store enough vitamin A to supply its nutritional needs for several months.[11] Approximately 95 per cent of the total vitamin A in the body is present in the liver; small but detectable amounts appear in the lungs and the kidneys.[12] In times of low intake this store is used to supply physiologic needs. During a prolonged deficiency, the reserve is gradually depleted, normal cell functions are suspended and pathologic change develops. In the rat this storage, physiologically speaking, seems to be of two types. By excess feeding of concentrates, enough vitamin A may be accumulated in the liver theoretically to supply normal requirements for several years. However, this supply decreases at a reasonably rapid rate, beginning immediately after the concentrate is withheld, until it reaches a level at which a more conservative mechanism governs its use. A sufficient supply remains to nourish the animal for some time, even on a deficient diet. In general, the reserves of the liver parallel the dietary intake but may represent only a fraction of the total consumption.[13] In human beings, as in all animals studied, the vitamin A content is much lower in the liver at birth, irrespective of the diet of the mother, than in the liver of the normal adult.[14] Accumulation of vitamin A in the liver tends to increase with age and is dependent on the character of the diet.

In the rat, neither general emaciation nor specific starvation due to other vitamin deficiencies has an influence on the hepatic reserves of vitamin A.[15] Chronic diseases and infection seem to lead to slightly lowered vitamin A reserves, probably owing either to reduced intake of vitamin A or to decreased assimilation in the alimentary tract and increased metabolic demands.[16] If one is to judge from autopsy material, nephritis and other diseases of the kidney and bladder definitely lower the vitamin A reserves. As yet the evaluation of data from such material is complicated by the uncertainty of what the normal reserves should be. Even assuming that the reserves are lower than normal, one has the added difficulty of deciding whether the lowering is cause or effect. One might expect greatly decreased reserves in association with severe disease of the liver, but existing data do not allow a conclusion on this point.

The vitamin A concentration of the liver of man,[16] the rat,[17] the cow [6] and the rabbit when the subject is well nourished but not "flooded" with vitamin A is from 200 to 400 international units per gram, or from 10 to 20 mg. per hundred grams. The content of chicken liver seems to be much higher under these conditions of stable saturation.[18]

The problem of the storage of vitamin A in the livers of fish is interesting from both the commercial and the physiologic point of view.[19] Certain species of fish, such as the halibut, yield liver oil of several hundred times the vitamin A potency of the average cod liver oil. As much as 1 per cent of the weight of halibut livers may be vitamin A. It is difficult to understand how this percentage could be stored vitamin derived from food only, especially since the diet of the halibut seems to be quite low in vitamin A. Of course the possibility exists that, although the concentration of the vitamin in the food is low, the large amount eaten, with gradual accumulation and unusual economy, in time leads to large reserves. That the reserves of the Newfoundland cod increase with age is evidence in support of this view. Phytoplankton, small marine algae, serve as the ultimate source of food for most sea animal life and have been found to contain biologically active carotene. The hypothesis is that these small plants are ingested by small crustacea or little fish, which in turn are eaten by larger fish, and so on, until the carotene of microscopic aquatic plant life becomes converted and stored as vitamin A in the livers of the larger fish. One of the points of weakness in this

8. Palmer, L. S.: The Chemistry of Vitamin A and Substances Having a Vitamin A Effect, J. A. M. A. **110:** 1748 (May 21) 1938.
9. Sherman, H. C., and Smith, S. L.: The Vitamins, American Chemical Society Monograph, New York, Chemical Catalog Company, Inc., 1931.
10. Sherman, H. C.: Chemistry of Food and Nutrition, New York, Macmillan Company, 1937.
11. Davies, A. W., and Moore, Thomas: The Influence of the Vitamin A Reserve on the Length of the Depletion Period in the Young Rat, Biochem. J. **31:** 172 (Jan.) 1937.
12. Moore, Thomas: The Distribution of Vitamin A in the Body of the Rat, Biochem. J. **25:** 275 (Jan.) 1931.
13. Davies and Moore.[11] Baumann, Riising and Steenbock.[31]
14. Ellison, J. B., and Moore, Thomas: The Vitamin A Reserves of Human Infant and Child in Health and Disease, Biochem. J. **31:** 165 (Jan.) 1937. Dann.[30]
15. Dann, W. J., and Moore, Thomas: The Effect of Vitamin B Deficiency upon the Vitamin A Reserves of the Rat, Biochem. J. **25:** 914 (March) 1931.
16. Moore, Thomas: The Vitamin A Reserve of the Adult Human Being in Health and Disease, Biochem. J. **31:** 155 (Jan.) 1937.
17. McCoord, A. B., and Luce-Clausen, Ethel M.: The Storage of Vitamin A in the Liver of the Rat, J. Nutrition **7:** 557 (May) 1934.
18. Cruickshank, Ethel M., and Moore, Thomas: The Effect of the Administration of Large Amounts of Vitamin A on the Vitamin A Content of the Hen's Egg, Biochem. J. **31:** 179 (Jan.) 1937. Guilbert, H. R., and Henshaw, W. R.: Vitamin A Storage in the Livers of Turkeys and Chickens, J. Nutrition **8:** 45 (July) 1934.
19. Sherman and Smith.[9] Drummond.[34] Harris.[35]

theory is the almost complete freedom from vitamin A or carotene of crustacea and copepods, the main articles of diet of the cod and the halibut. Crustacea and copepods do, however, contain pigments which originated from carotene and which, although not biologically active for a rat, may hypothetically serve as intermediates for synthesis of vitamin A by the fish. Another view could be that fish possess a power not present in mammals of synthesis from simple materials. This is pure speculation and has little experimental evidence to recommend it at present.

Absorption and Utilization.—Absorption and utilization of vitamin A and carotene are affected by the quantity administered and the manner of administration, the influence of other substances, the degree of saturation of the body and the general physiologic conditions of the alimentary tract.[20] The successful use of the rat test method for vitamin A activity is ample demonstration that amounts near the minimum requirements of either carotene or vitamin A are well utilized in this species. However, as the intake approaches a point which apparently exceeds the ability of the organism to absorb, convert and store, the efficiency decreases. Less than 10 per cent of an intake of vitamin A which is 2,000 times the necessary minimum is stored in the liver of the rat, while amounts which are not excessive but are satisfactory for optimum nutrition lead to 90 per cent storage.[21] Absorption of vitamin A both in the rat and human being reaches a maximum in three to five hours after administration as shown by disappearance from the intestine and rise in the blood level.[22] Under the same conditions carotene reaches a maximum level in the blood in from seven to eight hours. Fecal excretion accounts for only a small portion of the unutilized excess, the rest of which apparently finds other channels of excretion or is destroyed in the intestine or elsewhere in the body.[23] The other chief path of output, the kidney, seems to play no part in disposition of either vitamin A or its precursor unless the organism is literally flooded with vitamin A, in which case the vitamin is absorbed faster than it can be stored or destroyed and some "spilling" probably occurs into all body fluids.[24] This might be cited as evidence for the view that the organism possesses a mechanism for eliminating the unneeded excess by a destructive process, although delayed absorption undoubtedly results in some destruction in the intestine. The presence of bile [25] is not necessary but is helpful for absorption of vitamin A in the rat.

In general the assimilation of carotene is subject to great variations. Small quantities of carotene in oil are utilized under normal conditions to an extent of from 70 to 80 per cent, but it is generally agreed that larger quantities are not as well utilized as vitamin A.[26] This is especially true if the carotene is fed without being dissolved in oil or with low fat diets. A certain amount of normal absorption of fat seems necessary for transportation of carotene across the intestinal wall. On a fat-free diet rats assimilate only a small fraction of the same dose which is completely utilized when 10 per cent fat is included in the diet.[27] The importance of normal fat metabolism for absorption of carotene is further emphasized by the fact that in jaundice or choledochocolonostomized dogs the use of carotene is inhibited.[28] Some carotene is absorbed by rats with internal bile fistulas if bile acids are also fed. This fact suggests that bile acids directly or indirectly play a part in the transportation of carotene across the intestinal epithelium. One should bear in mind the possibility that a deficiency of vitamin A may arise in association with chronic diarrhea, obstruction of the biliary ducts, pancreatic dysfunction, celiac disease and other disorders involving prolonged faulty fat metabolism. In such cases absorption of carotene may be completely inhibited and assimilation of vitamin A greatly reduced.[29]

The direct absorption of vitamin A and carotene into the thoracic duct was demonstrated in a case of chylothorax in which it was possible to drain the chyle for study.[30] Reasonably large quantities of vitamin A were returned almost quantitatively in the chyle, while the recovery of equivalent quantities of carotene was far short of quantitative. The carotene seemed to be chemically free, but the vitamin A appeared in a form which indicated that esterification had probably occurred in the intestine, a fact which may be significant in view of its natural high absorbability. Both substances were associated with the nondiffusible fatty phase, as was to be expected.

The simultaneous presence of liquid petrolatum shows little effect on the absorption of vitamin A but seriously diminishes the absorption of carotene by competing with the solvent action of natural fats.[31] This emphasizes the desirability of giving liquid petrolatum separately from carotene-containing material.

During and for some time after certain infections, infants show diminished rates of absorption of carotene and vitamin A, which are not attributable to the accompanying fever, because elevated temperatures produced by other means have no such effect.[32] The explanation of this interesting observation is not clear, but the phenomenon seems to be due to decreased intestinal absorption.

One may conclude that, under ordinary circumstances of moderate intake, carotene is slightly less efficient than vitamin A but that, when rapid storage of vitamin A is desired or when there is intestinal disturbance, products such as eggs, milk and fish liver oils are preferable to carotene.[22]

Studies of the vitamin A and the carotene content of blood have been difficult because of the lack of satisfactory analytic methods for tissues of such low

20. Dutcher, R. A.; Harris, P. L.; Hartzler, E. R., and Guerrant, N. B.: The Assimilation of Carotene and Vitamin A in the Presence of Mineral Oils, J. Nutrition **8**: 269 (Sept.) 1934. McCollum.[8] Baumann, Riising and Steenbock.[21] Clausen.[22] Davies and Moore.[23] Rowntree.[31] Heymann.[32] Harris.[12]

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22. Clausen, S. W.: Limits of the Anti-Infective Value of Provitamin A (Carotene), J. A. M. A. **101**: 1184 (Oct. 28) 1933.

23. Davies, A. W., and Moore, Thomas: The Distribution of Vitamin A in the Organs of the Normal and Hypervitaminotic Rat, Biochem. J. **28**: 288 (Jan.) 1934. Baumann, Riising and Steenbock.[21] Heymann.[32]

24. Beller, R., and Brunner, O.: Excretion of Vitamin A in Urine, Klin. Wchnschr. **15**: 1196 (Aug. 1) 1936. Davies and Moore.[23] Heymann.[32]

25. Greaves, J. D., and Schmidt, C. L. A.: On the Absorption and Utilization of Carotene and Vitamin A in Choledochocolonostomized Vitamin A Deficient Rats, Am. J. Physiol. **111**: 492 (April) 1935.

26. Clausen.[22] Heymann.[32]

27. Ahmad, Bashir: The Fate of Carotene After Absorption in the Animal Organism, Biochem. J. **25**: 1195 (Aug.) 1931.

28. Greaves and Schmidt, footnotes 25 and 36.

29. Altschule, M. D.: Vitamin A Deficiency in Spite of Adequate Diet in Congenital Atresia of Bile Ducts and Jaundice, Arch. Path. **20**: 845 (Dec.) 1935.

30. Drummond, J. C.; Bell, M. E., and Palmer, E. T.: Observations on the Absorption of Carotene and Vitamin A, Brit. M. J. **1**: 1208 (June) 1935.

31. Rowntree, J. L.: The Effect of the Use of Mineral Oil upon the Absorption of Vitamin A, J. Nutrition **3**: 345 (Jan.) 1931. Dutcher and others.[20]

32. Heymann, Walter: Absorption of Carotene, Am. J. Dis. Child. **51**: 273 (Feb.) 1936. Clausen.[22]

concentrations.[33] The values for plasma carotenoid seem to be a measure of the difference between the rate of absorption from the intestine and the rate of conversion to vitamin A by the organism and not an index of nutritional reserves or intake. The vitamin A level in the plasma is subject to great variation even in normal, carefully controlled animals. However, it seems probable that refined methods will show consistent low values for the blood with deficiency, as compared with higher (although variable) values with normal nutrition. The concentration of vitamin A in the blood is independent of the quantity stored in the liver. Hardly enough work has been done on this subject to evaluate the significance of blood determinations.

After carotene is absorbed into the thoracic duct it is found in the liver in quantities dependent on the species. When a colloidal aqueous suspension of carotene is injected into the portal or systemic circulation, it is rapidly removed from the blood stream by the reticulo-endothelial system.[34] If sections of the liver are examined immediately after the injection, granules of pigment may be seen in the Kupffer cells. A greater part of the carotene is thus held in the liver, although carotene is held to a lesser extent elsewhere in the animal. The carotene in the Kupffer cells slowly disappears, and the concentration of vitamin A in the liver increases. Possibly the vitamin A of the liver also resides in the Kupffer cells, since livers which have had the parenchymal cells severely damaged by phosphorus poisoning, which supposedly does not harm the Kupffer cells, retain their store of vitamin A, and blocking of the reticulo-endothelial system by injections of certain particles lowers the capacity of the liver for storing vitamin A.[35] That the liver cells are necessary for the conversion of carotene to vitamin A is suggested by the fact that conversion is decreased by phosphorus poisoning [36] and, in certain diseases of cattle which involve the parenchymal cells, carotene remains unconverted in large quantities in the Kupffer cells.

It is important to note that in some cases carotenemia is due to a low ability to convert carotene and not necessarily to a high intake. The rate of transformation of carotene is diminished by diabetes [37] and certain diseases of the liver.

The conversion of carotene to vitamin A in vivo is a slow, variable process, demonstrable only after several days, in the rat, rabbit, hen and cow, while there is some question as to whether it occurs at all in the cat, a carnivorous animal.[38] In view of this fact, it is not surprising that attempts to bring about conversion in vitro have been in general unsuccessful.[39] Thus circumstantial evidence suggests the liver as the site of the formation of vitamin A, although no direct proof is available.

Vitamin A and Milk.—The surprisingly low reserves of vitamin A in the newborn [40] make plain the necessity for an adequate intake of vitamin A during infancy. The vitamin A content of milk is therefore important. Since the conversion of carotene to vitamin A in the animal is not always immediate and complete, a certain amount of the vitamin A activity of milk, eggs and other biologic fluids and tissues is due to carotene, the proportion depending on the dietary intake of plant products and the efficiency of the transformation mechanism of the particular animal.[41] It has been shown with cows consuming the same ration that about two thirds of the total activity in Guernsey milk is due to carotene, and this ratio remains rather constant as long as carotene is included in the ration; the carotene content of Ayrshire milk represents only about one third of the total activity, while Jersey milk contains about equal quantities of vitamin A and the provitamin. Thus the proportion of vitamin A activity due to carotene depends on the breed. It is an interesting fact that goat milk contains practically no carotene but that the vitamin A value remains remarkably constant even with considerable variation in rations.

One cannot conclude that the more highly pigmented milks necessarily have a higher vitamin A activity, for, although Guernsey milk may contain more carotene than other milks, it also contains less vitamin A, so the differences according to breed in total vitamin A activity seem to be small.

Most animals show a tendency to regulate the vitamin A content of their milk at a level characteristic of the species. In times of excess dietary intake, vitamin A accumulates in the liver and is used to stabilize the vitamin A content of the milk when the intake is less favorable.[10] Although this stabilizing process is not comparable with the efficiency of strict physiologic control, the vitamin A level in milk remains reasonably constant during average dietary variations.[42]

The extent to which the total vitamin A activity of the milk varies with the dietary intake depends on the nutritional state of the animal.[43] When the carotene intake of the cow is increased from a deficient level there is an immediate increase in both carotene and vitamin A in the milk; however, less influence is shown by each increment until a maximum is reached beyond which increased carotene intake does not affect the level of either carotene or vitamin A in the milk.

Cow's colostrum is from ten to one hundred times richer in vitamin A activity than milk, thus providing the calf with a concentrated food during the first few days of life.[44] There is no obvious variation in the vitamin A value of cow's milk with later periods of lactation.[45]

Dann [44] has shown that the combined carotene and vitamin A content of early human milk has from about

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34. Drummond, J. C.: The Vitamins, in Textbook of Biochemistry, Philadelphia, W. B. Saunders Company, 1935.

35. Lasch, Fritz, and Roller, Dietrich: The Influence of Blocking the Reticulo-Endothelial System on Vitamin A Metabolism of the Liver, Klin. Wchnschr. **15:** 1636 (Nov. 7) 1936.

36. Greaves, J. D., and Schmidt, C. L. A.: The Utilization of Carotene by Jaundiced and Phosphorus Treated Vitamin A Deficient Rats, Am. J. Physiol. **111:** 502 (April) 1935.

37. Ralli, Elaine P.; Pariente, A. C.; Brandaleone, Harold, and Davidson, Sidney: Effect of the Daily Administration of Carotene on the Blood Carotene of Normal and Diabetic Individuals, J. A. M. A. **106:** 1975 (June 6) 1936.

38. Capper, N. S.: The Transformation of Carotene into Vitamin A as Shown by a Study of the Absorption Spectra of Rat Liver Oils, Biochem. J. **24:** 980 (March) 1930. Harris.[34] Drummond.[34]

39. Drummond.[34] Harris[34]

40. Dann, W. J.: Transmission of Vitamin A from Parents to Young in Mammals, Biochem. J. **28:** 2141, 1934.

41. Baumann, C. A.; Steenbock, Harry; Beeson, W. M., and Rupel, I. W.: The Influence of Breed and Diet of Cows on the Carotene and Vitamin A Content of Butter, J. Biol. Chem. **105:** 167 (April) 1934.

42. Harris, L. J.: Vitamins, in Annual Review of Biochemistry, Stanford University, Calif., Stanford University Press **2:** 271, 1933. Sherman.[10]

43. Harris.[42] Gillam and others.[45]

44. Dann, W. J.: The Vitamin A and Carotinoid Contents of Human Colostrum and Milk, Biochem. J. **30:** 1644 (Sept.) 1936.

45. Gillam, E. G.; Heilbron, I. M.; Ferguson, W. S., and Watson, S. J.: Variations in the Carotene and Vitamin A Values of the Milk Fat (Butter) of Cattle of Typical English Breeds, Biochem. J. **30:** 1728 (Aug.) 1936.

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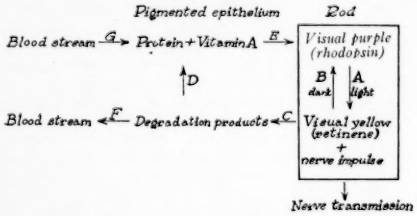
five to ten times the biologic activity of cow's milk and is not appreciably increased by feeding supplements of cod liver oil to the mother. Other investigators have reported that late human milk contains about the same amount of carotene and vitamin A as cow's milk. Human colostrum has from two to three times the biologic activity of early milk.

Vitamin A and Eggs.—Egg and milk formation are analogous biologic functions, and in general the vitamin A value of the egg is subject to the influences previously described for milk.[46] Dark-colored egg yolks are usually richer in vitamin A activity than light-colored yolks; however, pale eggs produced by hens on diets devoid of carotene and xanthophyll but containing cod liver oil are not appreciably lower in vitamin A potency. When the hen is on a deficient diet the vitamin A value of the egg will slowly decrease as the reserves of the liver are depleted, with a concomitant decrease in the production of eggs. Excess feeding of concentrates leads to considerable temporary increase of vitamin A



Vitamin A and the perception of light.

in the egg, but the value soon returns to a more stable level after the removal of the oil, in spite of the still high reserves in the liver.

Vitamin A and Cell Physiology.—One of the earliest functional changes observable in association with vitamin A deficiency is a decreased ability for dark adaptation, nutritional night blindness which responds to vitamin A therapy. The quantity of visual purple present in the retinas which have been dark adapted for varying periods demonstrates that the resynthesis of visual purple in vitamin A deficient animals is abnormally slow. It is possible also to demonstrate experimentally the correlation between the slow rate of regeneration of visual purple and the delayed dark adaptation.[47] Faulty twilight vision in vertebrates occurs with vitamin A deficiency because the mechanism for the formation of visual purple in the rod of the retina is defective.

Wald[48] has recently shown the previously reported high vitamin A value of retinal tissue to be due to vitamin A. He has presented strong evidence that visual purple is a conjugated protein in which vitamin A is a prosthetic group.

The cones of the retina are associated with the perceptions of color and other visual functions which depend on light of high intensity, while the rods are sensitive only to light and are especially adapted to function in dim light.[49]

The outside end of the rod which lies adjacent to the pigmented epithelium of the retina contains visual purple (rhodopsin) found only in the rods and serving to transform the energy of dim light into nerve impulses which vary, within limits, with the intensity of the light. Although the complete details of this photochemical process have not been ascertained, it has been suggested and considerable proof obtained that the cycle of events in the retinal rod when a molecule of visual purple receives a quantum of light energy is that shown in the accompanying illustration.[50]

The photosensitive pigment (visual purple) absorbs the light and as a consequence is decomposed into products which initiate a nerve impulse (reaction A). Other chemical systems immediately intervene to resynthetize these products to a new molecule of receptor pigment (reaction B or C + D + E) or they are disposed of as waste materials (reaction F) and an entirely new molecule is made from fresh raw material to take their place (reaction G + E). The quantity of visual purple which is present at any instant will depend on the difference between the rate of decomposition (reaction A; intensity of light) and the rate of synthesis (reactions B and E). In bright light the equilibrium of these reactions is displaced so that visual purple is practically absent from the retina, while in the dark the equilibrium is displaced in the opposite direction and visual purple is present in maximum quantity. Normal vision in dim light, whatever may be the details of the reaction, depends on an equilibrium somewhere between these two extremes.

Two processes are proposed for the synthesis of visual purple: from visual yellow by simple reversal of photolysis and from the protein plus vitamin A with the aid of the pigmented epithelium. That a certain proportion of visual yellow or retinene is converted to visual purple is observed in the isolated retina which has been bleached and replaced in the dark; the remainder decomposes and is lost or resynthesized by aid of the pigmented epithelium. The latter process takes place in the intact eye but has never been observed in the isolated retina. In vitamin A deficiency, reaction B or E or both are too slow to keep the supply of visual purple adequate.

The fact that the pigmented epithelium is essential to the visual purple process suggests the possibility that it, like other epithelial structures in times of vitamin A scarcity, may not function normally and thus indirectly also contribute toward visual impairment.

The chemistry and the physiology of vitamin A as revealed in its function as a component of visual purple do not necessarily imply the presence of a photosensitive substance in the more generally affected epithelial cells. However, they do suggest that vitamin A may serve as a prosthetic group in other conjugated proteins. The exact nature of these substances and how they function is one of the most interesting problems in cell physiology.

Vitamin A and Other Body Processes.—In association with vitamin A deficiency no significant deviations from the normal have been found for carbohydrate

46. Russel, W. C., and Taylor, M. W.: Vitamin A in Egg and Food, Chem. Abstr. **30**: 529 (Jan.) 1936; Use of Vitamin A and D by the Hen, J. Nutrition **10**: 613 (Dec.) 1935. Sherman.[10] Cruickshank and Moore.[38]

47. Fridericia, L. S., and Holm, E.: Influence of Deficiency of Fat-Soluble A Vitamin in the Diet on the Visual Purple in the Eye of the Rat, Am. J. Physiol. **73**: 63 (June) 1925.

48. Wald, George: Vitamin A in Eye Tissues, J. General Physiol. **18**: 905 (July) 1925. Wald, George, and Clark, Anna Betty: Sensory Adaptation and Chemistry of the Retinal Rod, Am. J. Physiol. **116**: 157 (June) 1936. Wald.[1]

49. Tansley, Katharine: Factors Affecting the Development and Regeneration of Visual Purple in the Mammalian Retina, Proc. Roy. Soc., London, s.B **114**: 79 (Nov.) 1933. Hecht.[50]

50. Hecht, Selig: Rods, Cones and the Chemical Basis of Vision, Physiol. Rev. **17**: 273 (April) 1937. Wald.[1]

metabolism, blood chemistry, absorption of fat, carbohydrate and proteins, nitrogen metabolism, and calcium and phosphorus metabolism.[51] Fat metabolism does not seem to be obviously altered, as fat is still absorbed, mobilized, desaturated and oxidized during vitamin A deficiency.[52]

Repeated attempts have failed to show any deviations of immunologic mechanisms with vitamin A nutrition which were not due to secondary factors, such as inanition and infection.[53]

PATHOLOGY

The specific pathologic changes of vitamin A deficiency are found in many epithelial structures and may be epitomized as follows: atrophy of the epithelium concerned, reparative proliferation of basal cells, and differentiation of the new product into a stratified keratinizing epithelium. This replacement epithelium, regardless of the previous functions and structure of the region, is identical in all locations and comparable in all its layers with epidermis. Other consequences of vitamin A deficiency are common to other nutritional disturbances, including other vitamin deficiencies.[54]

Epithelial Tissues.—Since the pathognomonic pathologic features of vitamin A deficiency are the consequence of epithelial changes, these will be described in some detail. Replacement by keratinizing epithelium is a late effect and follows a nonviable degree of epithelial atrophy. Reparative proliferation on the part of basal cells follows. In epitheliums of the stratified and transitional types, such as those of the cornea, conjunctiva, bladder, ureter and renal pelvis, the basal cells engaged in reparative proliferation may maintain a continuous layer from the beginning, and hence the process appears to be true metaplasia. In other epitheliums, such as those of ducts of glands, the respiratory mucosa and the uterus, where focally distributed basal cells alone have proliferative power, scattered areas of new cells appear. These groups of new (reparative) cells, by their continued growth, undermine, coalesce, and replace the original epithelium by a stratified keratinizing epithelium. Both in experimental animals and in infants, an atrophic epithelium having the histologic appearances of viability may remain for a period above the replacement epithelium. The latter may consist at first of only one or two layers of flat cells, as if the first effort was to cover surface as rapidly as possible. Continued multiplication of cells results in the epidermis-like tissue and separation of the atrophic original epithelium.

Many of the striking gross pathologic features of the deficiency in man and in animals are the outcome of the accumulation of keratinized epithelial cells in glands and their ducts and in other organs. In glands, cysts of considerable size, filled with yellowish cheesy masses of keratinized cells, are formed. In the lungs of human infants as well as of experimental animals this process leads to occlusion of bronchi, formation and filling of bronchiectatic cavities with keratinized cells, and atelectasis. Early workers regarded such cysts as abscesses, and hence vitamin A was believed to protect against infection.

The plugs of desquamated epithelial cells in ducts, bronchi and trachea, which open on regions normally infected with bacteria, act as a culture medium, yet rarely are the surrounding tissues invaded, presumably because of the protection offered by the stratified epithelium.

Distribution of the Keratinizing Metaplasia.[55]—In the rat, the order of response to vitamin A deficiency by keratinizing metaplasia is (1) salivary glands, including the submaxillary, parotid and all accessory glands of the tongue, buccal cavity and pharynx; (2) respiratory tract, including the nares, maxillary sinuses, Jacobson's organ, trachea and bronchi; (3) genito-urinary tract, including the renal pelves, ureters, bladder, epididymis, prostate, seminal vesicles, coagulating glands, uterus, oviducts and accessory sex glands of the vulva, and (4) eyes and paroucular glands, including the corneal and palpebral conjunctiva, the harderian, intra-orbital and extra-orbital lacrimal glands and the meibomian glands.

In the guinea pig, lesions of the conjunctiva and parocular glands did not develop in our experiments[56] even though advanced lesions (keratinizing metaplasia and its consequences) were found in all the other locations recorded for the rat. This we now know to have been due to the vitamin A in the orange juice used to prevent vitamin C deficiency. If cevitamic acid is employed for this purpose, the eyes respond late in the course of vitamin A deficiency, though less conspicuously than in rats. Early and extraordinary degrees of metaplasia as compared with this condition in the rat take place in the uterus and bladder of guinea pigs. In both rats and guinea pigs, permanent keratinizing of the vaginal epithelium takes place.

Mason[57] has studied in detail the consequences of vitamin A deficiency on the genital organs of rats. Atrophy of the testes in the male, noted by Wolbach and Howe,[58] was proved to be constant in animals with vitamin A deficiency even with an adequate supply of vitamin E.[59] In females[60] no injury of the ova, impairment of implantation or disturbances of endocrine function of ovary and anterior hypophysis could be shown. Retardation of growth and death of fetuses due to placental injury were found. Prolonged gestation due to decreased vitality and death of fetuses and difficult parturition with excessive uterine bleeding were other consequences. Resorption of fetal sites occurred with marked deficiencies. The effect on the fetus was shown to be due to placental injury in con-

51. Harris, L. J.: Vitamins, in Annual Review of Biochemistry, Stanford University, Calif., Stanford University Press **1**: 365, 1932.

52. Harris, L. J.: Vitamins, in Annual Review of Biochemistry, Stanford University, Calif., Stanford University Press **4**: 355, 1935.

53. Gelhorn, Ernst, and Dunn, Joan O.: The Influence of Lack of Vitamin A in the Diet on the Phagocytosis Promoting Properties of the Blood Serum, J. Nutrition **13**: 317 (March) 1937. Sherman.[19] Harris, footnotes 42, 51 and 93.

54. Jackson, C. M.: Recent Work on the Effects of Inanition and Malnutrition on Growth and Structure, Arch. Path. **7**: 1042 (June), **8**: 81 (July), 273 (Aug.) 1929.

55. Goldblatt, Harry, and Benischek, Maria: Vitamin A Deficiency and Metaplasia, J. Exper. Med. **46**: 699 (Nov.) 1927. Tyson, M. D., and Smith, A. H.: Tissue Changes Associated with Vitamin A Deficiency in the Rat, Am. J. Path. **5**: 57 (Jan.) 1929. Wolbach and Howe, footnotes 56, 58 and 68. Blackfan and Wolbach.[64]

56. Wolbach, S. B., and Howe, P. R.: Vitamin A Deficiency in the Guinea Pigs, Arch. Path. **5**: 239 (Feb.) 1928.

57. Mason, K. E., and Wolfe, J. M.: Relation of Castration to Vitamin A Deficiency in the Rat, J. Nutrition **9**: 725 (June) 1935. Mason, K. E., and Ellison, E. T.: The Demonstration of Oestrus in the Vitamin A Deficient Rat by Supravital Study of the Vaginal Smears, ibid. **10**: 1 (July) 1935; Changes in the Vaginal Epithelium of the Rat After Vitamin A Deficiency, ibid. **9**: 735 (June) 1935. Mason, footnotes 59 and 60.

58. Wolbach, S. B., and Howe, P. R.: Tissue Changes Following Deprivation of Fat-Soluble A Vitamin, J. Exper. Med. **42**: 753 (Dec.) 1925.

59. Mason, K. E.: The Specificity of Vitamin E for the Testis: I. Relation Between Vitamins A and E, J. Exper. Zool. **55**: 101 (Jan.) 1930.

60. Mason, K. E.: Foetal Death, Prolonged Gestation, and Difficult Parturition in the Rat as a Result of Vitamin A Deficiency, Am. J. Anat. **57**: 303 (Sept.) 1935.

trast to vitamin E deficiency when the primary effect is on fetal tissues.

In human infants [61] keratinizing metaplasia has been found in the conjunctiva, cornea, mucosa of the nares, accessory sinuses, including the maxillary antrums, trachea, bronchi, pancreas, renal pelves, ureters, salivary glands, uterus and periurethral glands. The commonest and earliest appearance of the metaplasia is in the trachea and the bronchi. Next in frequency is its appearance in the pelvis of the kidney. The early effect of the deficiency on the respiratory mucosa is a satisfactory explanation of the frequency, severity and persistence of the pneumonia that has been responsible in most instances for the death of infants deficient in vitamin A.[62]

The Eyes.—In the human being, as in experimental animals, involvement of the eye occurs late. The earliest demonstrable change is metaplasia of the epithelium of the conjunctiva and the cornea. Atrophy and metaplasia (of ducts) of the lacrimal glands contribute to the consequences of the accumulation of keratinized cells in the conjunctival sac. The cornea becomes vascularized, edematous and infiltrated with leukocytes. Necrosis of the cornea may occur beneath intact hyperkeratotic epithelium. Infection of the cornea, favored by the accumulation of keratinized cells, may lead to ulceration and hypopyon.

The Teeth.—Owing to atrophy and metaplasia of the enamel-forming organ, the continuously growing incisors of rats and guinea pigs are profoundly affected. After atrophy of the enamel-forming organ there are atrophy and cessation or depression of the functioning of odontoblasts. The formation of enamel stops, and striking deformities of the tooth take place because of diminished and defective formation of dentin.[63]

By keeping rats for long periods in a state of incomplete vitamin A deficiency, Orten, Burn and Smith [64] have produced tumor-like formations and tooth duplications at the formative end of the incisors, understandable because of the effect of deficiency on the enamel-forming epithelium. Boyle [65] has described in the tooth germ of an infant with vitamin A deficiency changes in the enamel organ comparable to those occurring in rodent incisors. May Mellanby [66] has summarized her work on teeth in an excellent review and presents evidence that absent or defective enamel and dentin formation are consequences of vitamin A deficiency. Recently May Mellanby and King,[67] presumably on the basis of Edward Mellanby's neurologic observations on vitamin A deficiency, expressed the thought that "loss of neurotrophic control owing to vitamin A deficiency may be partly responsible for pyorrhoea and other diseases of the periodontal tissues and even of dental caries." In all probability, vitamin A deficiency during the formative period of teeth outranks in the human being all other vitamin deficiencies in importance.

The Respiratory Tract.—The consequences of vitamin A deficiency on the respiratory tract can be inferred from the fact that the respiratory mucosa in all locations undergoes keratinizing metaplasia. As atrophy precedes the replacement, clinical effects of the deficiency in all probability occur long before keratinizing epithelium makes its appearance. Death due to pneumonia is common in infants.[62] The pneumonia is usually of the interstitial or peribronchitis type. Regions of atelectasis due to plugging of bronchioles by keratinized cells and bronchiectasis due to cystic dilatation of bronchi from the same cause are gross features of the lungs. The lusterless opaque lining of keratinized cells may be apparent in larger bronchi and tracheas. In the accessory sinuses and nares and probably in the eustachian tubes are other regions where consequences of vitamin A deficiency are obvious.

The Skin.—No noteworthy consequence of vitamin A deficiency in the skin of experimental animals has been described. In Blackfan and Wolbach's cases [68] no cutaneous condition was noted that could be attributed solely to the deficiency. Dryness and scaliness of the skin have been noted, as in malnutrition of diverse causes in infants.

In sexually mature persons, cutaneous lesions associated with vitamin A deficiency and analogous to those occurring in other epithelial structures have been reported by several authors, chiefly from China, but also from South Africa, England and America. The skin becomes dry and rough and then a papular eruption appears. The papules are formed by hyperkeratosis of the hair follicles. Atrophy of sweat glands and keratinizing metaplasia of their ducts are responsible for absence of sweat. Sebaceous glands atrophy and undergo keratinizing metaplasia. The order of appearance and distribution of the papules due to hyperkeratosis of hair follicles is the anterolateral aspect of the thighs and the posterolateral aspect of the upper part of the forearms, extensor surface of the arms and legs, shoulders, abdomen, back, buttocks, the fore part of the neck and the back of the neck. There is a general increase in the pigmentation of the skin and conjunctivae, although in the hyperkeratotic hair follicles and immediately adjacent epidermis the pigment is decreased. Mu, Frazier and Pillat [69] have demonstrated an increase both of melanin-building pigments and of melanin in the darkened skin and conjunctivae. The best clinical and pathologic descriptions and the complete bibliography are to be found in a recent paper by Frazier and Hu,[70] the first to describe this condition.

The Stomach and Intestine.—Hyperkeratosis with ulceration in the forestomach of rats as a consequence of vitamin A deficiency has frequently been reported. This part of the stomach of the rat is normally lined with stratified squamous epithelium. While hyperkeratosis is of frequent occurrence (we have seen and studied these lesions), it cannot be regarded as specific. Pappenheimer and Larimore,[71] who were the first to describe such lesions, excluded vitamin deficiency as

61. Blackfan, K. D., and Wolbach, S. B.: Vitamin A Deficiency in Infants, J. Pediat. **3**: 679 (Nov.) 1933.

62. Blackfan and Wolbach.[61] Sweet and K'Ang.[53]

63. Wolbach, S. B., and Howe, P. R.: The Incisor Teeth of Albino Rats and Guinea Pigs in Vitamin Deficiency and Repair, Am. J. Path. **9**: 275 (May) 1933.

64. Orten, Aline U.; Burn, C. G., and Smith, A. H.: Effects of Prolonged Chronic Vitamin A Deficiency in the Rat with Special Reference to Odontomas, Proc. Soc. Exper. Biol. & Med. **36**: 82 (Feb.) 1937.

65. Boyle, P. E.: Manifestations of Vitamin A Deficiency in a Human Tooth, J. Dental Research **13**: 39 (Feb.) 1933.

66. Mellanby, May: The Influence of Diet on the Structure of the Teeth, Physiol. Rev. **8**: 545 (Oct.) 1928.

67. Mellanby, May, and King, J. D.: Diet and the Nerve Supply to the Dental Tissues, Brit. Dent. J. **56**: 538 (June) 1934.

68. Wolbach, S. B., and Howe, P. R.: Epithelial Repair in Recovery from Vitamin A Deficiency: An Experimental Study, J. Exper. Med. **57**: 511 (March) 1933.

69. Mu, J. W.; Frazier, C. N., and Pillat, A.: Melanin Pigment of the Skin and Conjunctiva in Avitaminosis A in Man, Chinese J. Physiol. **11**: 247 (March) 1937.

70. Frazier, C. N., and Hu, C. K.: Nature and Distribution According to Age of Cutaneous Manifestations of Vitamin A Deficiency, Arch. Dermat. & Syph. **33**: 825 (May) 1936.

71. Pappenheimer, A. M., and Larimore, L. D.: The Occurrence of Gastric Lesions in Rats: Their Relation to Dietary Deficiency and Hair Ingestion, J. Exper. Med. **40**: 719 (Dec.) 1924.

a factor. Fuzimaki has reported on unsatisfactory evidence the development of the gastric lesions into carcinoma. That vitamin A deficiency and carcinogenesis are not related has been shown by Sugiura and Benedict.[72]

Lesions of the stomach and intestine in association with vitamin A deficiency are of rare occurrence in man and in experimental animals and, beyond slight degrees of atrophy of the mucosa, are probably not related specifically to the deficiency. The esophagus in man [73] and animals responds by hyperkeratinization. References to gastro-intestinal disturbances in man caused by vitamin A deficiency are given by Robertson.[4]

Genito-Urinary Tract.—In rats complete obstruction of the ureters and renal pelves due to accumulation of keratinized cells may be the cause of death. In human infants [68] less marked degrees of this change are common and may be grossly recognizable post mortem. The formation of calculi in vitamin A deficient rats is probably dependent on an additional factor, as calculi are of extremely rare occurrence in our experience. Keratinization in the urinary bladder occurs in man as well as in laboratory animals. Atrophy of the testes and keratinizing metaplasia of the uterine mucosa may be expected in human adults.

The Nervous System.—Signs suggestive of nerve lesions in human beings with vitamin A deficiency have not been reported. The experience of investigators has varied in regard to the occurrence of paralysis and other signs of nervous lesions in experimental animals. Hughes, Aubel and Lienhardt [74] in 1928 described extreme incoordination and spasms in swine and found degeneration of myelin sheaths in the spinal cord and in the optic, sciatic and femoral nerves. The same writers [75] also recorded similar signs and lesions in fowls and cattle. In neither report were the affected nerve fibers identified as motor or sensory. Edward Mellanby [76] in 1931 reported incoordination, spasticity and paralysis in dogs nurtured on diets containing much cereal and no vitamin A. Degeneration of myelin sheaths in the spinal cord, particularly in the sensory tracts, was reported.

Seifried [77] in 1932 described ataxia, incoordination and convulsions in fowls. He found degeneration in anterior horn cells of the cord, in ganglion cells of the motor cortex, the nucleus dentatus and nuclei of the medulla, and in the Purkinje cells of the cerebellum. Demyelinization was found in the spinal cord and in the sciatic, brachial and optic nerves. It is to be noted that motor nerve cells were largely involved.

Zimmerman [78] in 1933 described paralysis in rats after very short periods on a vitamin A deficient diet, the majority showing paralysis within forty days. Degeneration of myelin sheaths was found in the brachial plexus and the sciatic nerves but not in the optic nerves. In the spinal cord the lesions were in the sensory tracts and in the crossed and direct pyramidal tracts. Details of the experiment and an account of the signs exhibited by these animals were subsequently reported by Aberle.[79]

Edward Mellanby [80] in 1934 recorded degeneration of cells of the gasserian ganglion and myelin degeneration of the ophthalmic division of the fifth nerve in rabbits, a dog and rats. He stated, though without presenting his evidence, that degeneration of the afferent nerves is widespread with vitamin A deficiency. The importance of Mellanby's paper lies in his speculation that the epithelial changes of vitamin A deficiency are secondary to loss of neurotrophic control. Similar speculations by May Mellanby [67] in regard to the pathology of teeth have been mentioned. Setterfield and Sutton [81] in 1935 reported degeneration of myelin sheaths in the sciatic and femoral nerves in white rats and claimed superiority for their technic using polarized light on frozen sections of nerves fixed in solution of formaldehyde. Zimmerman and Cowgill [82] confirmed Zimmerman's [78] and Aberle's [79] work and stated that carotene added to the diet prevents the nerve lesions. Carotene, however, did not restore function to the nervous system, even though other evidences of A deficiency were cured. This was attributed to the permanent nature of the nerve lesions.

Failure to observe signs of nerve lesions or to find degeneration of myelin sheaths in vitamin A deficient animals are recorded by an impressive number of workers. Duncan [83] in 1931 reported: "No consistent differences were observed in nerves from animals on diets low in vitamin A or E when compared to nerves from rats of the same age" and "the nerves from healthy well nourished rats exhibited changes equal to those in rats extremely emaciated and paralyzed from the effects of feeding on a diet low in vitamin B." Suzman, Muller and Ungley [84] found no nervous lesions in adult dogs on a diet deficient in vitamin A. Grinker and Kandel [85] failed to observe nervous symptoms in monkeys fed on a vitamin A deficient diet and found no degenerative lesions of myelin sheaths in the central nervous system. Arthur Weil of Chicago and Charles Davison of New York, in the discussion of Grinker and Kandel's paper, reported failures to find nerve lesions in rats in experiments with vitamin A deficiency.

Radhakrishna Rao,[86] in studies with rabbits, rats and fowls, although often finding myelin degeneration in the afferent nerves of the eye, failed to correlate the degeneration with the onset and course of the ocular lesions. Repair of the corneal lesions following administration of vitamin A took place without recovery of the nerve lesions. He concluded that "there is no evidence to suggest that xerophthalmia is secondary to

72. Sugiura, Kanematsu, and Benedict, S. R.: A Critical Study of Vitamin A and Carcinogenesis, J. Cancer Research **14:** 306 (June) 1930.

73. Sweet, L. K., and K'Ang, H. J.: Clinical and Anatomic Study of Avitaminosis Among the Chinese, Am. J. Pediat. **50:** 699 (Sept.) 1935.

74. Hughes, J. S.; Aubel, C. E., and Lienhardt, H. F.: The Importance of Vitamin A and Vitamin C in the Ration of Swine, Tech. Bull. 23, Kansas State Agricultural Experiment Station, June 1928.

75. Hughes, J. S.; Lienhardt, H. F., and Aubel, C. E.: Nerve Degeneration Resulting from Avitaminosis A, J. Nutrition **2:** 183 (Nov.) 1929.

76. Mellanby, Edward: The Experimental Production and Prevention of Degeneration in the Spinal Cord, Brain **54:** 247 (Sept.) 1931.

77. Seifried, Oskar: Cited by Robertson.[4]

78. Zimmerman, H. M.: Lesions of the Nervous System in Vitamin Deficiency, J. Exper. Med. **57:** 215 (Feb.) 1933.

79. Aberle, S. B. D.: Neurological Disturbances in Rats Reared on Diets Deficient in Vitamin A, J. Nutrition **7:** 445 (April) 1934.

80. Mellanby, Edward: Xerophthalmia, Trigeminal Degeneration and Vitamin A Deficiency, J. Path. & Bact. **38:** 391 (May) 1934.

81. Setterfield, H. E., and Sutton, T. S.: The Use of Polarized Light in the Study of Myelin Degeneration: The Degeneration of Myelinated Nerves in Avitaminosis A in the White Rat, J. Nutrition **9:** 645 (June) 1935.

82. Zimmerman, H. M., and Cowgill, G. R.: Lesions of the Nervous System in Vitamin Deficiency: The Effect of Carotene in the Treatment of the Nervous Disorder in Rats Fed a Diet Low in Vitamin A, J. Nutrition **11:** 411 (May) 1936.

83. Duncan, Donald: The Marchi Method: A Discussion of Some Sources of Error and the Value of This Method for Studying Primary Changes in the Myelin Sheath, Arch. Neurol. & Psychiat. **25:** 327 (Feb.) 1931.

84. Suzman, M. M.; Muller, G. L., and Ungley, C. C.: An Attempt to Produce Spinal Cord Degeneration in Dogs Fed a High Cereal Diet Deficient in Vitamin A: The Incidental Development of a Syndrome of Anemia, Skin Lesions, Anorexia and Changes in the Concentration of Blood Lipoids, Am. J. Physiol. **101:** 529 (Aug.) 1932.

85. Grinker, R. R., and Kandel, Ernestine: Experimental Vitamin (A, B, B_2 and B Complex) Deficiency: Histologic Changes in the Central Nervous System, Arch. Neurol. & Psychiat. **30:** 1287 (Dec.) 1933.

86. Radhakrishna Rao, M. V.: Studies on Vitamin A Deficiency: I. Xerophthalmia and Trigeminal Nerve Degeneration, Indian J. M. Research **29:** 439 (Oct.) 1936.

a loss of the neurotrophic control of the ophthalmic division of the trigeminal nerve."

Eveleth and Biester [87] maintained that "neither vitamins A nor B complex are responsible for the myelin degeneration of the spinal cords and peripheral nerves in swine."

Wolbach and Howe [58] in 1925 stated: "As the rats exhibited no symptoms pointing to lesions of the nervous system, the peripheral nerves were not studied. No lesions were found in brain, cerebellum and sympathetic ganglia." Marchi preparations were not made. A review of their records show that a few rats, shortly before death, showed extreme muscular weakness and did drag their hind legs. This was attributed to extreme degeneration of the muscles. In work now in progress under a grant from the Milton Fund to the Harvard Dental School, in which diets devised by Otto Bessey are being used, signs of nerve lesions do not appear in rats and guinea pigs. Studies of the nervous system made by R. L. Swank [88] with his very reliable modification of the Marchi technic failed to show degeneration of myelin in the spinal cord or peripheral nerves in rats and guinea pigs which had exhibited extreme keratinizing metaplasia of epitheliums.

There is no substantial evidence that degeneration of myelin sheaths is a specific consequence of vitamin A deficiency. That it does occur in some strains of laboratory animals cannot be denied. The relation of degeneration of skeletal muscle to the signs regarded as of nervous origin is a problem having a bearing on the subject. Severe degeneration of muscle is common in association with vitamin A deficiency in man, guinea pigs and rats.[59]

We have observed degeneration of skeletal muscles in guinea pigs deficient in vitamin C and in rats deficient in vitamin B_2 complex. Goettsch and Pappenheimer [90] have described a "progressive highly selective and ultimately fatal dystrophy of the voluntary muscles" in guinea pigs and rabbits on diets with adequate vitamin content. No significant lesions were found in the spinal cord and peripheral nerves. The same authors, with Rogers,[91] could find no alterations of the motor nerve terminals in muscle. It is not clear whether Marchi preparations were employed, as emphasis was placed on silver impregnation methods. These papers by Pappenheimer and his associates are pertinent to the present discussion because they indicate the possibility of ascribing to nerve lesions behavior of laboratory animals caused by muscle degeneration.

Since degeneration of myelin sheaths is not a constant accompaniment of vitamin A deficiency, as is epithelial metaplasia, it is not necessary to present the many objections to Mellanby's thesis that loss of nerve function may be the cause of the epithelial changes which are invariably the consequence of vitamin A deficiency regardless of species.

Other consequences of vitamin A deficiency, which are not specific, are (1) inability to store fat, (2) hemosiderosis apparently due to anemia, (3) cessation of growth of bones, (4) the degenerative lesions of skeletal muscles already mentioned and (5) lymphoid hypoplasia of the spleen.

Loss of fat occurs in spite of an abundant supply, but this takes place with other vitamin deficiencies, notably deficiency of the B_2 complex. The anemia in infants and experimental animals is accompanied by hemosiderosis in the spleen and liver and, finally, by atrophy of the spleen and bone marrow. In animals, restoration of vitamin A to the diet causes regeneration of bone marrow, disappearance of hemosiderin from the spleen and liver and, in the rat and the guinea pig, active hyperplasia of the spleen and an outburst of erythroblastic activity. The anemia and hemosiderosis also occur with B_2 complex deficiency and with prolonged partial vitamin C deficiency.

The effect of vitamin A deficiency on growth of bone is complete cessation of endochondral bone formation, indistinguishable from that occurring in any long-continued state of malnutrition.

While Mason [60] has studied some of the consequences of vitamin A deficiency in the rat on gestation and parturition, the importance of further research is indicated by the brief publication of Hale [92] recording in the offspring of vitamin A deficient swine various congenital defects, including defective eyes, absence of eyes, misplaced kidneys, harelip, cleft palate and extra earlike growths.

Excessive administration of vitamin A concentrates to experimental animals has been reported to result in damage to bone, kidneys, skin and other soft tissue. However, conclusive evidence awaits a preparation of pure material. No injury is likely by use of the usual liver oils even in high dosage. Large doses of carotene given orally or by injection are innocuous.[93]

Repair in Recovery from Vitamin A Deficiency.—Repair after restoration of vitamin A to the diet is rapid. In rats there is a lag of a few days, but within six to eight days gain in weight, resumption of growth in bones and teeth, and regeneration of bone marrow and spleen are apparent. Reparative changes in the metaplastic epithelium begin as early as the fifth day.[68] The initial changes are separation of superficial keratinized cells and vacuolization of cells of intermediate layers. The epithelium becomes divided into two zones in consequence of progress of vacuolar degeneration and leukocytic infiltration. All those cells, apparently irreversibly differentiated toward keratinization, undergo degeneration; the deep zone, corresponding to the stratum germinativum of epidermis, survives, and the cells proceed to differentiate into the type of epithelium originally present. On the whole the change is an abrupt one and affords further evidence that the epithelial changes of vitamin A deficiency are primary and not of nervous origin, particularly as Zimmerman and Cowgill [82] failed to restore function to the nervous system by administering carotene, while all other manifestations of the consequences of their vitamin A deficient diet were cured.

The changes in the repair of epitheliums after vitamin A deficiency have their normal counterpart in changes in the vagina of rodents during the part of the estrous cycle in which the cornified vaginal epithelium returns to the mucous type.

87. Eveleth, D. F., and Biester, H. E.: The Significance of Myelin Sheath Degeneration and Its Relation to Incoordination, Am. J. Path. **13:** 257 (March) 1937.

88. Swank, R. L., and Davenport, H. A.: Marchi's Staining Method: Studies of Some of the Underlying Mechanisms Involved, Stain Technology **9:** 11 (Feb.) 1934.

89. Wolbach and Howe, footnotes 56 and 58. Blackfan and Wolbach.[61]

90. Goettsch, Marianne, and Pappenheimer, A. M.: Nutritional Muscular Dystrophy in the Guinea Pig and Rabbit, J. Exper. Med. **54:** 145 (Aug.) 1931.

91. Rogers, W. M.; Pappenheimer, A. M., and Goettsch, Marianne: Nerve Endings in Nutritional Muscular Dystrophy in Guinea Pigs, J. Exper. Med. **54:** 167 (Aug.) 1931.

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93. Harris, L. J.: Vitamins, in Annual Review of Biochemistry, Stanford University, Calif., Stanford University Press **3:** 275, 1934.

Council on Physical Therapy

THE COUNCIL ON PHYSICAL THERAPY HAS AUTHORIZED PUBLICATION OF THE FOLLOWING REPORTS. HOWARD A. CARTER, Secretary.

GODSEND HEARING AID NOT ACCEPTABLE

Manufacturer: Godsend Hearing Aid Company, 4204 Davis Lane, Cincinnati.

The Godsend Hearing Aid consists of the following parts: (1) a microphone transmitter of the carbon ball type housed in a brown molded bakelite case, weight 59 Gm.; (2) a magnetic midget type air conduction receiver of the direct current excitation type, weight 10 Gm.; (3) a bone oscillator in a laminated bakelite case with spring head band, weight 28 Gm.; (4) a carbon particle amplifier housed in a bakelite case containing a current varying rheostat, the housing fitted with pins for plugging directly into a battery jack, weight 60 Gm., and (5) a bakelite battery case accommodating three ordinary flashlight cells, weight 56 Gm. without battery. In addition, there are the usual connecting cords.

The unit was investigated by a consultant appointed by the Council. He pointed out certain faults in the mechanical construction and performance of the hearing aid. The design of the microphone transmitter is clumsy and bulky; the rheostat arm mounted in the amplifier case is made of thin sheet metal, easily deformed by accident and uncertain in operation. This frail lever might easily be rendered inoperative in any position as the result of pressure of the clothes. In the model submitted, the arm did not make contact over the middle range of the rheostat. Also the air conduction receiver is faulty in that the ear piece (which does not conform to the contours of the ear but merely terminates in a bulb) fits rather loosely in the receiver, so that the two may fall apart.

Performance tests showed that the current drain of the Godsend Hearing Aid was exceptionally high. Thus, with three new cells delivering 4.5 volts at the terminals, the set with rheostat full on draws more than 220 milliamperes; even when only two cells are used with 3 volts the drain is more than 140 milliamperes. The high current drain resulted in the very rapid exhaustion of the three flashlight cell battery furnished with the instrument. Consequently the tests for amplification and intelligibility were conducted with large dry cells capable of maintaining their terminal voltages constant under the large current drain. It was further observed that the hearing aid was unstable, owing to self oscillation, when operated with three new dry cells and the rheostat full on.

Intelligibility and loudness gain tests were performed. For the apparatus in question, it was found that increasing the loudness by moving the rheostat arm toward the full-on position resulted in a severe loss of intelligibility. Indeed, even when the battery current was cut down to 60 milliamperes as against a maximum value of 220 the intelligibility was not greater than 80 per cent. With this low setting it is very difficult to transmit single unfamiliar names over the instrument and its rating for this purpose is not greater than 30 per cent. The loudness gain, moreover, for this setting is approximately 8 decibels (average of four observers). The largest loudness gain observed was for maximum rheostat setting and averaged 23 decibels, but under these circumstances the intelligibility was practically zero; certainly the instrument was unusable.

When the apparatus was examined for bone conduction oscillation, similar results were obtained.

Exaggerated and misleading claims are made in the advertising matter. These claims, as noted later, suggest that the ideal hearing aid has been found. This is certainly incompatible with facts in the hearing aid research. Excerpts from a pamphlet entitled "Joyful News for the Deaf" follow: "Great happiness awaits you," "the principle of the Godsend Hearing Aid has turned a silent, cold, lonely world into a paradise," "restores normal hearing," "easier to adjust and take on and off than a pair of gloves," "you may obtain instant relief from deafness," "most improved type of hearing aid which leading ear specialists approve and recommend," "ready to bring you good hearing immediately after you take it out of the box" and "open the door to the happiness that normal hearing can bring you."

A leaflet, "Here's Sensational, History-Making News," contains the same type of exaggerated claims. Quotations follow: "Now, even those who have considered themselves hopelessly deaf—totally cut off from the world of conversation . . . may HEAR again," "overcome the obstacle of advanced hearing defect" and "it is possible to hear . . . where even people with normal hearing must frequently strain to understand."

The name "Godsend Hearing Aid" is compatible with the firm's grandiose claims, but the Council does not consider the name an appropriate one for an instrument of this sort.

In view of the foregoing report, the Council on Physical Therapy voted not to accept the Godsend Hearing Aid for inclusion in its list of accepted devices, since it is an inferior instrument, faulty in mechanical construction and a poor acoustic amplifier. It is apt to be of little, if any, use to a person with defective hearing. In addition, the advertising matter contains many exaggerated or misleading claims, as aforementioned.

ELECTRO-EAR AND ROSETTE MODEL HEARING AIDS NOT ACCEPTABLE

Manufacturer: American Earphone Company, 10 East Forty-Third Street, New York.

The Electro-Ear and the Rosette Model of the Electro-Ear are battery operated hearing aids. The Electro-Ear consists of two parts, an earpiece fitting directly into the ear and a small case with self-contained microphone and battery. Either two or three ordinary flashlight batteries supply the current, 3 or 4½ volts. A slide switch on top of the case provides volume control.

In the Rosette Model the microphone and transmitter are separate. This model is available for air conduction with or without mechanical amplification and amplified bone conduction. The mechanical amplifier fits on top of the battery. Single or double transmitters may be employed. Current may be supplied by 3 or 4½ volt batteries.

The discrete sentence intelligibility test was adopted by the Council as being the most suitable method of determining the usefulness of a carbon microphone hearing aid. This test gives an index or figure of merit which permits comparison between various instruments and at the same time rates or scales them in relation to a theoretically perfect instrument.

Briefly, the intelligibility test is conducted as follows: A number of relatively short and simple statements (usually 100) are read before the microphone of the hearing aid and the listener repeats each sentence as he hears it. If he interprets 90 per cent of 100 statements correctly, the hearing aid is given a 90 per cent intelligibility rating. Obviously, the rating will vary with several factors unrelated to the hearing aid, such as the type and degree of the hearing loss of the individual using the instrument, the voice quality of the speaker, the distance of the speaker from the microphone, and the acoustic properties of the room in which the speaker and microphone are located.

In the testing of these instruments, the investigator's voice was used throughout with the normal conversational tone and loudness, the mouth being six feet distant from the microphone. The speaker was in one room with the microphone, and the listener in an adjacent room. A piece of metal tubing about three inches in diameter and a foot in length extended through the brick wall of one room into the other. The cords of the microphones were wrapped in felt and run through this tubing, which was then packed tight with felt to minimize the loudness of the speaker's voice in the listener's room. A high quality microphone was also placed in the listener's room and connected through the pipe to an amplifier and reproducer before the speaker so the responses of the listener could be determined. Two normal and two hard-of-hearing persons

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cooperated in the testing. The normal persons could just hear the speaker's voice but not sufficiently well to understand any of the sentences without the assistance of one of the aids. The speaker adjusted the setting of the volume controls on the microphones of the hearing aids to the intensity level preferred by each person, determined by practice sentences.

In the accompanying table, listeners W and X had normal hearing, Y had an approximately uniform hearing loss of 30 decibels from 64 to 8,192 cycles, and Z had a uniform loss of approximately 45 decibels over the same frequency range. Y had normal bone conduction, while the bone conduction of Z was slightly below normal.

Hearing aid I is the Electro-Ear instrument with small battery contained within the microphone case. Hearing aid IIA is the Rosette model employing air conduction without the amplifier attached; IIB is the same instrument with the amplifier, and IIC is the same unit equipped for amplified bone conduction, these being the various ways to assemble or hook up the components of the Rosette model. It was necessary to use the mechanical amplifier (the accessory fitting on top of the battery) with the bone conduction receiver in order to obtain maximum volume.

These data compare favorably with the results obtained from the same listeners with three other well known makes of hearing aids, each tested with amplified air and bone conduction, the medium pitched receivers being used when a choice was available.

Results (Stated in Percentage of Intelligibility)

	I	IIA	IIB	IIC
W (normal)	93%	90	88	85
X (normal)	90	91	86	83
Y (30 db. loss)	91	87	86	84
Z (45 db. loss)	*	*	83	79

* This person's loss was too great to obtain much value with unamplified air conduction under the test conditions.

Some hard-of-hearing persons cannot obtain worthwhile benefit from any type of portable hearing aid. If the performance of these instruments is unsatisfactory, the firm states in its advertising matter that the purchase price will be refunded, less a small fee for trial (coverage).

The instruments look durable but each of the models has a possible weakness. In the Electro-Ear the cord from the case to the earpiece may be protected against wear and friction by a rubber grommet or some such protective device at the point where the cord passes out through the case. It also seems that the resistance wire of the volume control of the Rosette Model should be enclosed so that it would not be exposed to dirt and dust.

The advertising matter put out with these units contains objectionable or misleading statements. One piece, "All Modern Hearing Devices," states that these instruments are "individually suited to every degree of deafness." This statement should be deleted or evidence submitted to support it. It is noted that several hearing devices are advertised which have not been submitted to the Council for consideration, notably "Twin-Fone," "Super-Ear" and "Vibratube."

In view of the foregoing report, the Council on Physical Therapy voted not to accept the Electro-Ear and Rosette Model of the Electro-Ear hearing aids for inclusion in its list of accepted devices because the advertising matter contains misleading or objectionable statements and, further, each unit has certain deficiencies in construction as pointed out in this report. In addition, the Council believes that these units will be of benefit only to persons with slight impairment in hearing.

The foregoing report was submitted to the firm with a statement to the effect that the Council would reconsider the unit without prejudice, provided the firm improved the construction of the hearing aid and revised the advertising matter.

Ample time was given the firm to submit the improved models and the revised advertising. The new equipment and revised advertising matter have not been received.

Council on Pharmacy and Chemistry

NEW AND NONOFFICIAL REMEDIES

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED AS CONFORMING TO THE RULES OF THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION FOR ADMISSION TO NEW AND NONOFFICIAL REMEDIES. A COPY OF THE RULES ON WHICH THE COUNCIL BASES ITS ACTION WILL BE SENT ON APPLICATION.

PAUL NICHOLAS LEECH, Secretary.

EPHEDRINE SULFATE-LILLY (See New and Nonofficial Remedies, 1938, p. 228).

The following dosage form has been accepted:

Ampoules Ephedrine Sulfate-Lilly, 1 cc., 0.025 Gm. (⅜ grain).

ANTIPNEUMOCOCCUS SERUM TYPES IV AND VIII COMBINED.—An antiserum containing antibodies of both types IV and VIII pneumococci (Diplococci pneumoniae).

Dosage.—Intravenously, first dose, 10,000 units of each type, followed by a second dose of from 20,000 to 40,000 units of each type one and one-half hours later; when indicated, the second dose may be repeated at two hour intervals.

Lederle Laboratories, Inc., Pearl River, N. Y.

Antipneumococcic Serum, Types IV and VIII, Refined and Concentrated.—Prepared by immunizing horses with intravenous injections of cultures of type IV and type VIII pneumococci. When test bleedings show the serum to have reached a sufficient degree of potency the horses are bled aseptically and the serum refined and concentrated by means of the ethyl alcohol precipitation method described by Lloyd D. Felton (*J. Immunol.*, November 1931, p. 347). The usual sterility tests prescribed by the National Institute of Health are carried out and safety tests are made by injection into white mice and guinea pigs. The potency tests are based on the method described by Lloyd D. Felton (*J. Infect. Dis.*, December 1928, p. 531). The potency of the preparation is expressed in terms of the unit developed by Felton (*Boston M. & S. J.*, May 15, 1924, p. 819; *J. Infect. Dis.*, September 1925, p. 199, October 1925, p. 309) and used by Park. The unit is based on the smallest amount of antibody that will protect against one million fatal doses of virulent type IV and VIII culture. In actual laboratory practice a carefully standardized control serum is used in each test as a basis of comparison. The procedure for the mouse protection potency test for both type IV and VIII antibody is exactly similar to that described for type I antibody (*J. Immunol.*, July 1932, p. 91). Marketed in packages of one vial containing 10,000 units each of types IV and VIII and in packages of one vial containing 20,000 units each of types IV and VIII. Each package contains a vial of normal horse serum (1:10 dilution) for the conjunctival test.

ANTIPNEUMOCOCCUS SERUM TYPES V AND VII COMBINED.—An antiserum containing antibodies of both types V and VII pneumococci (Diplococci pneumoniae).

Dosage.—Intravenously, first dose, 10,000 units of each type, followed by a second dose of from 20,000 to 40,000 units of each type one and one-half hours later; when indicated, the second dose may be repeated at two hour intervals.

Lederle Laboratories, Inc., Pearl River, N. Y.

Antipneumococcic Serum, Types V and VII, Refined and Concentrated.—Prepared by immunizing horses with intravenous injections of cultures of type V and type VII pneumococci. When test bleedings show the serum to have reached a sufficient degree of potency the horses are bled asceptically and the serum refined and concentrated by means of the ethyl alcohol precipitation method described by Lloyd D. Felton (*J. Immunol.*, November 1931, p. 347). The usual sterility tests prescribed by the National Institute of Health are carried out and safety tests are made by injection into white mice and guinea pigs. The potency tests are based on the method described by Lloyd D. Felton (*J. Infect. Dis.*, December 1928, p. 531). The potency of the preparation is expressed in terms of the unit developed by Felton (*Boston M. & S. J.*, May 15, 1924, p. 819; *J. Infect. Dis.*, September 1925, p. 199, October 1925, p. 309) and used by Park. The unit is based on the smallest amount of antibody that will protect against one million fatal doses of virulent type V and VII culture. In actual laboratory practice a carefully standardized control serum is used in each test as a basis of comparison. The procedure for the mouse protection potency test for both type V and VII antibody is exactly similar to that described for type I antibody (*J. Immunol.*, July 1932, p. 91). Marketed in packages of one vial and in packages of one syringe containing 10,000 units each of types V and VII; also in packages of one vial and in packages of one syringe containing 20,000 units each of types V and VII. Each package contains a vial of normal horse serum (1:10 dilution) for the conjunctival test.

PHENOBARBITAL SODIUM-ABBOTT (See New and Nonofficial Remedies, 1938, p. 125).

The following dosage form has been accepted:

Tablets Phenobarbital Sodium-Abbott, 1 grain.

RINGER'S SOLUTION (See New and Nonofficial Remedies, 1938, p. 357).

Ringer's Solution: Each 100 cc. contains sodium chloride 0.7 Gm., potassium chloride 0.03 Gm. and calcium chloride 0.025 Gm. Marketed in bottles of 500 and 1,000 cc.

Prepared by the Abbott Laboratories, North Chicago, Ill.

SULFANILAMIDE (See New and Nonofficial Remedies, 1938, p. 450).

Pulvoids Sulfanilamide, 5 grains.
Prepared by the Drug Products Company, Inc., New York. No U. S. patent or trademark.
Sulfanilamide Tablets, 5 grains.
Prepared by Sharp & Dohme, Philadelphia and Baltimore. No U. S. patent or trademark.

DEXTROSE (See New and Nonofficial Remedies, 1938, p. 162).

The following dosage form has been accepted:

The Abbott Laboratories, North Chicago, Ill.

Dextrose 10% in Ringer's Solution: Each 100 cc. contains dextrose, U. S. P., 10 Gm., sodium chloride 0.7 Gm., potassium chloride 0.03 Gm. and calcium chloride 0.025 Gm. Supplied in bottles containing 500 and 1,000 cc.

VIOSTEROL IN OIL (See New and Nonofficial Remedies, 1938, p. 482).

Viosterol (A. R. P. I. Process) in Oil-Lederle.—A brand of viosterol in oil-N. N. R.

Manufactured by the American Research Products, Inc., a division of General Mills, Inc., Minneapolis, under license agreement with E. I. du Pont de Nemours Co. (Lederle Laboratories, distributor). U. S. patent applied for.

Viosterol (A. R. P. I. Process) in oil-Lederle is prepared by activation of ergosterol through the action of low speed electrons by suitable controlled electrical means. The activated ergosterol is dissolved in bland vegetable oil biologically assayed and adjusted to have the potency of viosterol in oil-N. N. R.

Council on Foods

ACCEPTED FOODS

THE FOLLOWING PRODUCTS HAVE BEEN ACCEPTED BY THE COUNCIL ON FOODS OF THE AMERICAN MEDICAL ASSOCIATION AND WILL BE LISTED IN THE BOOK OF ACCEPTED FOODS TO BE PUBLISHED.

FRANKLIN C. BING, Secretary.

H & H BRAND PURE PRUNE JAM

Manufacturer.—Max Ams, Incorporated, New York.

Description.—Prune preserve made from dried prunes and cane sugar.

Manufacture.—Selected sun-dried California prunes are subjected to steam in a pressure cooker to soften them, pitted and cooked with 15 per cent solution of cane sugar. The jars are filled with the mixture at 88 C.

Analysis (submitted by manufacturer).—Moisture 42.1%, total solids 57.9%, soluble solids 56.5%, ash 1.1%, fat (ether extract) 0.2%, protein (N × 6.25) 1.6%, sucrose 2.9%, reducing sugars as dextrose 37.3%, reducing sugars as invert sugar 38.9%, crude fiber 1.1%, carbohydrates other than crude fiber (by difference) 53.9%.

Calories.—2.24 per gram; 64 per ounce.

BRADWAY CHOCOLATE FLAVORED SYRUP

Manufacturer.—The Bradway Chocolate Company, Inc., Newcastle, Ind.

Description.—A beverage base consisting of sucrose, water, tapioca, flour, cocoa and chocolate, salt, artificial flavoring and tartaric acid.

Manufacture.—Cane sugar and water are mixed, constantly agitated while being heated in a steam jacketed copper kettle to 104 C. for twenty minutes to promote inversion and cooled to 88 C. Formula proportions of the remaining ingredients are added. The mixture is stirred, homogenized at 2,500 pounds pressure, filled into five-gallon pails and sealed at 71 C.

Analysis (submitted by manufacturer).—Moisture 19.6%, total solids 80.4%, ash 1.6%, fat (ether extract) 4.7%, protein (N × 6.25) 2.8%, sucrose 25.4%, reducing sugars as invert sugar 30.9%, crude fiber 0.5%, carbohydrates other than crude fiber (by difference) 70.8%, caffeine * 0.055%, theobromine 0.21%.

Calories.—3.37 per gram; 96 per ounce.

* Calculated from an analysis of cocoa and chocolate.

GLORY WHEAT CREAM FARINA

Manufacturer.—The Teichgraeber Milling Company, Gypsum, Kan.

Description.—Purified wheat middlings or endosperm.

Manufacture.—Selected winter wheat is cleaned, scoured, tempered and milled in the usual manner. The purified middlings are separated by the usual process of sifting and aspirating and are automatically packaged and weighed.

Analysis (submitted by manufacturer).—Moisture 12.5%, total solids 87.5%, ash 0.4%, fat (ether extract) 0.8%, protein (N × 5.7) 12.3%, crude fiber 0.2%, carbohydrates other than crude fiber (by difference) 73.8%.

Calories.—3.52 per gram; 100 per ounce.

NUTRADIET FRESH GREEN BABY LIMA BEANS PACKED IN WATER

Distributor.—The Nutradiet Company, a subsidiary of S & W Fine Foods, Inc., San Francisco.

Description.—Canned green baby lima beans packed in water without added sugar or salt.

Manufacture.—Henderson Bush Lima Beans grown within 2 to 5 miles of the cannery are harvested with vines intact and the beans are removed from the vines at the plant, shelled, cleaned with screens and blowers, graded, blanched, cooled in a spray washer and filled into cans. Water is added. The cans are exhausted, sealed and processed for twenty-five minutes at 121 C. and cooled. No insecticide spray is used on the beans, which are canned in from two to six hours after being harvested.

Analysis (submitted by manufacturer).—Moisture 80.9%, total solids 19.1%, ash 0.7%, fat (ether extract) 0.3%, protein (N × 6.25) 4.7%, crude fiber 1.0%, carbohydrates other than crude fiber (by difference) 12.4%.

Calories.—0.51 per gram; 14 per ounce.

Claims of Manufacturer.—For use in special diets in which sugar or salt is proscribed or in quantitative diets of calculated composition.

GLORY WHOLE WHEAT

Manufacturer.—The Teichgraeber Milling Company, Gypsum, Kan.

Description.—A precooked whole wheat breakfast cereal.

Manufacture.—Selected durum wheat is cleaned, mixed with formula proportions of water and salt and cooked under pressure for about ten minutes. When the desired pressure has been reached, it is suddenly released and the wheat is expelled into a screened bin to allow expansion. The product is then screened and dried to between 7 and 8 per cent of moisture content and packaged in moisture proof cellophane bags.

Analysis (submitted by manufacturer).—Moisture 7.4%, total solids 92.6%, ash 1.7%, fat (ether extract) 1.3%, protein (N × 5.7) 15.3%, crude fiber 0.8%, carbohydrates other than crude fiber (by difference) 73.5%.

Calories.—3.67 per gram; 104 per ounce.

MRS. PALEY'S BABY FOOD—STRAINED SPINACH

Manufacturer.—Paley-Sachs Food Company, Houston, Texas.

Description.—Canned, cooked sieved spinach, slightly seasoned with salt.

Manufacture.—Fresh spinach is trimmed, inspected, thoroughly washed, precooked for five minutes, strained, filled into glass jars, vacuum sealed and heat processed.

Analysis (submitted by manufacturer).—Moisture 92.0%, total solids 8.0%, ash 1.7%, fat (ether extract) 0.3%, protein (N × 6.25) 2.1%, reducing sugars as dextrose—trace, sucrose—trace, crude fiber 0.8%, carbohydrates other than crude fiber (by difference) 3.1%, calcium (Ca) 0.1%, phosphorus (P) 0.046%, iron (Fe) 0.003%.

Calories.—0.2 per gram; 6 per ounce.

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SATURDAY, JUNE 18, 1938

DEPOSITION OF LIPIDS IN THE LIVER

Investigations have established the essential role of the liver for maintaining the life processes. The clear-cut results of hepatectomy and other experimental procedures leave little doubt that this organ is essential for the normal metabolism of the three so-called proximate principles the proteins, the carbohydrates and the lipids. Of the transformations occurring in the liver both under normal and under pathologic conditions, the alterations in lipid content are most striking. It is relatively simple to produce an increase in the quantity of liver lipids in normal animals by administration of diets containing either a high cholesterol or a high fat content. The ease with which this is produced makes available a ready means of determining experimentally the factors which may influence the deposition of lipids in the liver. The role of choline in this connection has already been discussed in these columns.[1] More recently, experimental evidence has accumulated to suggest the importance of endocrine influence in regulating the quantity of liver lipids.

The development of modern knowledge regarding the role of the anterior pituitary gland in lipid metabolism owes much to the investigations of Burn and Ling,[2] who demonstrated that the injection of certain extracts of the anterior pituitary gland produces an increased excretion of ketone bodies in rats consuming a fat-rich diet. Subsequent studies have confirmed this observation and have served to emphasize the importance of the anterior pituitary gland in the regulation of the rate of lipid metabolism and in the mobilization of the lipids from the body stores to organs, such as the liver, actively concerned in the utilization of this foodstuff. The detailed investigations of Best and Campbell[3] have made available interesting experimental data regarding the factors influencing the deposition of lipids in the liver. The daily injection of suitable extracts of the anterior lobe of the pituitary produced in rats, guinea pigs and mice a rapid increase in size and a marked fatty infiltration of the liver within a few days of the first injection. The increase in size and weight was due chiefly to deposition of fat and water and was accompanied by a decrease in total body fat and an increased excretion of ketone bodies. Although there was some species variation in the degree of the response to anterior pituitary extract, the results in general were similar. The extent of the fat deposition in the liver is in some instances almost as great as that which can be regularly produced by the other methods; e. g., by feeding fat or cholesterol. However, in contrast to the inhibiting action of choline on the deposition of lipids in the livers of animals ingesting a high fat diet, this nitrogenous base did not prevent the increase in liver fat produced by large doses of the anterior pituitary preparation.

These investigations confirm the numerous reports now available indicating the profound influence of the anterior pituitary gland on the processes of intermediary metabolism. Although the best available extracts are still crude, at least in a chemical sense, clinical administration of such anterior pituitary preparations which undoubtedly contain this fat mobilizing and ketogenic principle have already been made, sometimes in considerable doses. In view of the rapid deposition of lipids produced in the livers of experimental animals by the injections of these extracts, caution should be exercised in employing anterior pituitary therapy in unrestricted quantities in treating human patients until further chemical fractionation has been accomplished.

1. Choline and Fat Metabolism, editorial, J. A. M. A. **106**: 1201 (April 4) 1936.
2. Burn, J. H., and Ling, H. W.: J. Physiol. **69**: xix (May 31) 1930.
3. Best, C. H., and Campbell, J.: J. Physiol. **86**: 190 (Feb.) 1936; **92**: 91 (Feb.) 1938.

ARMY MEDICAL MUSEUM AND LIBRARY

Congress has passed the bill authorizing the construction of a new building for the Army Medical Library and Museum. At last the world's mightiest collection of medical literature and one of the largest of medical museums will be given adequate quarters.

Fifty-five years ago[1] a committee of the American Medical Association composed of three of America's greatest medical men made a study of the needs of the Army Medical Museum and Library for a building. The committee was composed of Dr. Samuel D. Gross of Philadelphia, the leading surgeon of his day, Dr. Austin Flint of New York, one of the greatest American diagnosticians, and Dr. Oliver Wendell Holmes of Boston, the "Autocrat of the Breakfast Table." The books of the Surgeon General's Library, as it was then called, were stored in Ford's Theater, the scene of President Lincoln's assassination. The specimens of the Army Medical Museum were likewise in storage, and not even in one place. The library then contained 70,000 volumes and 66,000 pamphlets. The museum had some 20,000 specimens. There were 117 medical

1. Minutes of the American Medical Association at Its 34th Annual Session, Held in Cleveland, Ohio, June 5, 6, 7, 8, 1883, J. A. M. A. **1**: 3 (July 14) 1883.

journals published in the country. The *Index Medicus* was not yet four years old. The *Index Catalogue* had not yet advanced beyond the stage of the *Specimen Fasciculus*. John Shaw Billings had been librarian for eighteen years. Congress, duly impressed with the need for a building, made the necessary appropriation. The present well known red brick building that has housed the Army Medical Library for more than half a century resulted from this action.

Library buildings, particularly those built fifty years ago, had no provisions for expansion. Even the beautiful building of the Library of Congress has been outgrown and additions are now in progress. Under the administration of the Medical Department of the Army, the Army Medical Library and Museum have grown steadily until they are now the largest institutions of their kind in America, and probably in the world. The old building is full to overflowing, and the engineers permit no more books to be placed in the stacks except by removal of old volumes to make way for the new. Every nook and cranny is filled with precious volumes. In the museum too the saturation point is almost reached. The Army Medical Library has grown to a million items. The museum has 60,000 specimens and half a million microscopic slides, besides 67,000 negatives of pathologic material. The library subscribes to 2,000 medical journals. Now it is time for history to repeat itself. The American Medical Association played a great part in obtaining the legislation for the old building and contributed with equal force in obtaining the new. At the hearings of the committee in Congress a representative of the Association officially endorsed the movement by authority of the House of Delegates. Other distinguished medical men gave evidence, and letters from more than a hundred more were presented. The medical profession may congratulate itself on the enactment of the bill to authorize the new building.

But this is not enough. Under our legislative procedure the appropriation called for by the authorization bills must be obtained. The Committee on Appropriations of the Senate and House of Representatives will shortly consider this. If we want the new building built now—and the need is nothing less than urgent—we must let our representatives in both houses of Congress know of our desire. The foundation for the building is already laid: not the foundation of stones and mortar but that of Congressional approval. The Army has done its part—we should do ours. This is the national medical library and museum. The Army Medical Department, which conceived them, has administered them for a century, but always with the full knowledge of all concerned that they are at the service of the whole profession. The Army Medical Library and Museum have been efficiently administered all these years, and to the entire satisfaction of the American medical and allied professions. They should continue under control of the Army Medical Department. The service of the sisters—the library and the museum—has been the more effective because of their intimate association. Let us uphold the hands of the Surgeon General of the Army in this and, in gratitude for what the Army Medical Library and Museum have done for us, cooperate in every way in securing adequate quarters for our two great scientific institutions. Thus we shall serve well the medical profession of today and of tomorrow.

BRONCHOSPIROMETRY

Before the twentieth annual meeting of the American Association for Thoracic Surgery at Saranac Lake, N. Y., last year, Jacobæus [1] of Stockholm presented a bronchoscopic method for determining the size and function of the lung. The method enables determination of the vital capacity, the reserve air and the residual air of each lung. The oxygen intake and the carbon dioxide output may be determined for a unit of time. Earlier attempts to separate the respired air from each lung were concerned chiefly with animal experiments and were based on the principle advanced by Pflüger in 1870. In his technic a catheter, supplied with a distensible rubber cuff at its distal end, was passed into each of the two main bronchi. The experiment called for a performance of a preliminary tracheotomy and the introduction of cannulas, the breathing being recorded on separate spirometers. For obvious reasons this experiment was not applicable to man. In 1932 Jacobæus conceived the idea of separating the air from each lung with the aid of a bronchoscope. At his suggestion a double bronchoscope was devised, one stem of which with a rubber cuff attached is fixed in one of the main bronchi, the other in the trachea, the latter stem thus conveyed the air from the other lung. The proximal ends of the bronchoscope are connected with a double spirometer whereby the curves are simultaneously recorded from the two lungs separately.

The method is apparently harmless, since no severe accident was recorded among the 300 patients in whom bronchospirometry was practiced by Jacobæus and Björkman. The cases examined included lung tumors, bronchiectasis and postpneumonic conditions. For tuberculous patients these authors regard a recent hemoptysis as the only contraindication.

Bronchospirometry, when compared with other physical methods of examination, particularly roentgenologic examination, presents certain definite advantages. Jacobæus cites two cases of artificial pneumothorax to show how enormously the function may vary in spite of the fact that on roentgenologic examination the two lungs did not show great difference and that the one with the worse function proved to be the better aerated. Bronchospirometric studies in patients on whom a thoracoplasty was performed demonstrated that the operation need not destroy the function of the collapsed

1. Jacobæus, H. C.: Bronchospirometry: A Review of Present Experiences and Some Further Investigations, J. Thoracic Surg. **7**: 235 (Feb.) 1938.

lung forever and that a certain amount of return of the function may take place. The method likewise demonstrated that the healthy lung in thoracoplasty diminishes in volume because of the displacement of the mediastinum.

Jacobæus made the interesting observation that it is the healthy lung that brings about the violent expiration which constitutes the cough. The affected lung takes little or no share in coughing. In other words, the lung that is most in need of emptying its secretion has the least chance to do so. The sputum in such cases must first pass the bifurcation before being brought up by coughing.

The method appears to be particularly valuable in cases in which there is a question of operative intervention for bilateral lesions. It permits determination of the function of a lung and the indications and contraindications for operation.

Current Comment

SOURCE OF TYPHOID IN CITIES

In a case of typhoid recently reported in San Francisco it was determined that the patient had crossed the country from Boston by motor, beginning this journey exactly sixteen days before the onset of symptoms in San Francisco. The health commissioner of San Francisco wrote promptly to health departments in Massachusetts, New York, Indiana, Illinois, Ohio, Iowa, Nebraska, Wyoming, Utah, Nevada and California, outlining the trip which the patient had taken. Information was received from Indiana that several cases of typhoid had been traced to the place where the California patient had eaten a meal. Information was received from the board of health in Chicago stating that six cases of typhoid had been reported to the board in persons who had traveled on the bus lines between Chicago and the East. Typhoid therefore can become rapidly and widely disseminated today from a small focus because of new methods of transportation.

PNEUMOCONIOSIS AND PULMONARY CARCINOMA

Contrary to widespread clinical belief, industrial dust does not appear to be an etiologic factor in pulmonary carcinoma unless such dust contains recognized carcinogenic substances, such as radium or tar. In order to test the correlation between inhaled dust and primary neoplasm of the lungs, Vorwald and Karr [1] of the Trudeau Foundation, Saranac Lake, N. Y., assembled all available roentgenographic data. Of the 57,000 cases thus far reported, roentgenologic evidence suggested primary pulmonary tumor in but three, an incidence of 0.005 per cent. Of 1,357 cases of silicosis studied in their own laboratory, but one case of pulmonary tumor was diagnosed. Of their 14,230 cases in which silicosis was not present, only two presumptive pulmonary tumors were noted. The general impression from this statistical evidence is that the incidence of pulmonary tumor is perhaps even lower in pneumoconiotic persons than that reported in routine necropsies of the general population. This roentgenologic evidence was supplemented by detailed necropsies from 3,739 cases collected from the world literature and 178 from their own laboratories. There were but thirty-two cases in the combined series showing primary malignant changes in the lungs. This suggests an average incidence of about 0.8 per cent. The statistical evidence was further supplemented by a study of 3,338 laboratory animals exposed for periods varying from a few months to three years to heavy concentrations of industrial dusts. Guinea pigs, rabbits, chickens, mice and rats were used in these tests. Fourteen different types of industrial dust were tried. Of special interest were forty mice of a known carcinoma-susceptible strain. At necropsy only two pneumoconiotic animals (guinea pigs) showed the presence of pulmonary neoplasm. In both cases the lesions were interpreted as benign adenomas. The authors conclude that inhaled dusts, except those containing recognized carcinogenic substances (e. g., radium or tar) cannot be considered as etiologic factors in the development of primary carcinoma of the lungs.

1. Vorwald, A. J., and Karr, J. W.: Am. J. Path. **14**: 49 (Jan.) 1938.

BIOCHEMICAL METASTASIS IN TUBERCULOSIS

Among the more recent discoveries of immunology no fact is of greater clinical interest than the observation that local tissue specificity is altered in many local pathologic conditions and that the locally formed biochemical abnormalities may be transported to and adsorbed by apparently normal peripheral tissues. Since this phenomenon was first demonstrated in malignant disease, the term "biochemical metastasis" has been proposed [1] to denote this transportation and induction of abnormal immunochemical specificities in apparently normal organs. The latest confirmation is by Dmochowski [2] of the State Hygienic Institute, Warsaw, who has studied the implanted tissue specificities in cases of chronic tuberculosis. The Polish immunochemist injected rabbits with aqueous, alcoholic and ether extracts of bovine caseous material and thus produced an antibovine serum. This antiserum gave strong precipitin and complement deviation reactions with extracts from both human and bovine tuberculous material but no reaction with similar extracts from normal human tissues. It was apparently "caseation specific." Twelve tuberculous, three chronic suppurative and fifteen nontuberculous, nonsuppurating cadavers were studied by means of this antiserum. Dmochowski found that both the tuberculous tissues and chronic suppurative tissues reacted strongly to the "caseation specific" antibody. Caseation specific reactions were also given by extracts from the apparently normal liver, kidney, spleen and heart muscle of the same cadavers. With few exceptions the nontuber-

1. Hirszfeld, L.; Halber, W., and Laskowski, J.: Ztschr. f. Immunitätsforsch. **64**: 61 (Nos. 1 and 2) 1929.
2. Dmochowski, L.: Ztschr. f. Immunitätsforsch. **90**: 363 (May 27) 1937.

culous, nonsuppurative cadavers were entirely negative in his control tests. Dmochowski interprets these results as evidence of a wide distribution of degeneration products from caseous and suppuration foci, and the deposit of these degeneration specificities in apparently normal tissues and organs. Other interpretations are, of course, possible.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST: SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION AND PUBLIC HEALTH.)

CALIFORNIA

Society News.—Dr. Henry W. F. Woltman, Rochester, Minn., will discuss "Postoperative Neuritis" before the San Diego Academy of Medicine June 21.——At a meeting of the San Diego County Medical Society May 24 Dr. Robert W. Lamson, Los Angeles, spoke on "Twentieth Century Auto-Intoxication."——Dr. George D. Huff addressed the San Diego County Obstetrical and Gynecological Society May 25 on "Utero-Salpingoscopy." —— Dr. Edwin W. Schultz, Stanford University, addressed the Hollywood Academy of Medicine April 21 on "Property and Nature of Viruses."

Promotions in University Faculty.—The University of California Medical School, San Francisco, announces the following promotions on the faculty, among others:

Dr. Robert S. Stone, to professor of roentgenology.
Dr. John B. de M. Saunders, to professor of anatomy.
Frank W. Allen, Ph.D., to assistant professor of biochemistry.
Dr. Raymond J. Reitzel, to associate clinical professor of medicine.
Dr. John J. Sampson, to associate clinical professor of medicine.
Dr. Stacy R. Mettier, to associate professor of medicine.
Dr. John B. Lagen, to assistant professor of medicine and pharmacology.
Dr. Paul A. Gliebe, to assistant professor of psychiatry.
Dr. Laurence Taussig, to associate clinical professor of dermatology.
Dr. Montague S. Woolf, to associate clinical professor of surgery.
Dr. H. Brodie Stephens, to assistant clinical professor of surgery.
Dr. George C. Hensel, to assistant clinical professor of orthopedic surgery.
Dr. Robert C. Martin, to associate clinical professor of otorhinolaryngology.
Dr. Lewis F. Morrison, to associate clinical professor of otorhinology.

CONNECTICUT

Society News.—Dr. Charles H. Goodrich, Brooklyn, discussed "Public Health and Preventive Medicine in Private Practice" before the Hartford County Medical Association at its recent annual meeting, and Dr. Maurice T. Root, West Hartford, as retiring president spoke on "An Everyday Approach to Some Pressing Medical Problems."

Maternal and Infant Mortality.—The infant mortality rate in Connecticut in 1937 was 40.5 per thousand births as compared with 42.3 in 1936. The total number of deaths was 908. According to the Connecticut *Health Bulletin*, this is a reduction of about 70 per cent since 1901, when the rate was 138 per thousand births. The maternal mortality rate in 1937 was 2.9, a decrease over the rate for 1936 when it was 4.7.

Changes in Health Officers.—The following have been appointed health officers of the places indicated:

Dr. George S. Lambert, Killingly.
Dr. Arthur D. Marsh, Scotland.
Dr. Joseph L. Roy, Thompson.
Dr. Francis Brewer, Brookfield.
Dr. Wilfred J. T. Robinson, East Windsor.
Dr. John H. McLaughlin, Voluntown.
Dr. William L. Higgins, Andover.

FLORIDA

Personal.—Dr. Alvin L. Stebbins, Punta Gorda, has been appointed health officer of Escambia County, succeeding Dr. William H. Pickett, Pensacola, resigned. Dr. Stebbins has recently been health officer of Franklin, Gulf, Liberty and Calhoun counties.——Dr. Haynsworth D. Clark, Fort Pierce, was named president-elect of the Florida Railway Surgeons Association at its annual meeting in Miami and was reelected secretary-treasurer.

Society News.—The Dade County Medical Society was addressed recently by Drs. Warren W. Quillian, Coral Gables, on pediatrics and Herman Boughton, Miami Beach, pneumonia.——At a meeting of the Duval County Medical Society in Jacksonville April 5 a symposium on deficiency diseases was presented by Drs. William W. Kirk, Ernest B. Milam and Ferdinand Richards, all of Jacksonville. —— The Pinellas County Medical Society was addressed in St. Petersburg April 15 by members of the Hillsborough County Medical Society; the speakers, all of Tampa, were Drs. Henry Mason Smith on "Pituitary Tumor"; Robert G. Nelson, "A Plea for Obstetrics as a Specialty" and James T. Cowart, "Practical Pediatrics."

GEORGIA

Hardman Cup Honor to Dr. Sydenstricker.—The name of Dr. Virgil P. W. Sydenstricker, professor of medicine, University of Georgia School of Medicine, Augusta, will be inscribed on the L. G. Hardman Loving Cup, it was announced at the annual meeting of the Medical Association of Georgia. This honor is awarded annually to the physician considered to have rendered the most distinguished medical service during the previous year. The cup was given to the state medical association by the late Governor Hardman, who was a member of the association for more than fifty years, graduating from the University of Georgia Medical Department in 1876 and Bellevue Hospital Medical College in 1877.

ILLINOIS

Society News.—Dr. George W. Hall, Chicago, addressed the Peoria City Medical Society in Peoria April 19 on "The Relationship Between the Physical and Psychic Disturbances of the Patient." Dr. Harry E. Mock, Chicago, addressed the society April 5 on "Management of Craniocerebral Injuries." Dr. Willis S. Lemon, Rochester, Minn., discussed "The Development and Metamorphosis of the Primary Tubercle" before a recent meeting.——Dr. Quitman U. Newell, St. Louis, discussed "Prolapsus Uteri" before the Adams County Medical Society in Quincy May 9.

Chicago

Capps Prize Awarded.—Dr. Ronald R. Greene has received the Joseph A. Capps Prize of $500 for 1937 for his work on "Experimental Production of Interscxuality in the Female Rat." Founded by the late Dr. Edwin R. LeCount, the award is made annually by the Institute of Medicine of Chicago for the most meritorious investigation in medicine by a graduate of a recognized medical school in Chicago within two years after the completion of an internship or of one year in laboratory work. Dr. Greene graduated at Northwestern University Medical School, Chicago, in 1935.

Patients with Purpura Haemorrhagica and Polycythemia.—Members of the department of medicine of the University of Illinois College of Medicine are interested in studying patients with purpura haemorrhagica and polycythemia. Physicians are asked to communicate with Dr. Major H. Worthington, superintendent of Research and Educational Hospital, 1819 W. Polk Street, for additional information concerning the free hospitalization of these patients. Case histories of the patients should be sent to the hospital. The service is available only to residents of Illinois.

INDIANA

University News.—The Indiana University School of Medicine, Indianapolis, will receive a bequest of $5,000 under the will of the late Dr. J. P. Heath, Fishers, newspapers reported recently. Dr. Heath also bequeathed his medical library to the school.

Hospital News.—The new $250,000 ward building at the Logansport State Hospital was dedicated May 12; it will provide accommodations for 219 mental patients.——The new wing of the Witham Memorial Hospital, Lebanon, was dedicated May 12; 45 per cent of the approximate $160,000 cost of the unit was paid by the federal government and the balance by Boone County; the hospital now has a capacity of sixty beds.

District Meetings.—A symposium on gallbladder diseases was presented before the Eighth District Medical Society in Muncie May 10 by Drs. Clarence F. G. Brown and John L. Lindquist, Chicago, and Byrl R. Kirklin, Rochester, Minn. Dr. Frank H. Lahey, Boston, was the speaker at the banquet. ——Dr. Rettig A. Griswold, Louisville, Ky., addressed the Fifth District Medical Society in Terre Haute May 6 on "Surgical Procedures in Office Practice." This meeting was a joint dinner session with the Vigo County Medical Society, the Terre Haute Academy of Medicine and the Aesculapian Society of the Wabash Valley.——At a meeting of the Sixth District Medical Society in Richmond May 5 the speakers were Drs.

Gerald W. Gustafson, Indianapolis, on "Normal Delivery and Breech Presentation"; Lyman T. Meiks, Indianapolis, "Care of the Newborn and Premature Infant," and Henry Close Hesseltine, Chicago, "Treatment of Hemorrhage of Late Pregnancy."

IOWA

Public Health Meeting.—The twelfth annual meeting of the Iowa Public Health Association was held at the Hotel Fort Des Moines May 10 under the presidency of Dr. William Woodburn, Boone. Out of state speakers included Drs. Allan J. McLaughlin, Ann Arbor, Mich., on "Local Health Organization in Relation to Public Health" and Florian E. Schmidt, Chicago, "Management of the Pneumonias." Dr. Walter L. Bierring, Des Moines, state health commissioner, spoke on "Marshaling Health Forces Against Pneumonia."

Twin Lakes District Meeting.—The dry diagnostic clinic and fifteenth annual assembly of the Twin Lakes District Medical Society will be held at Rockwell City High School, Rockwell City, June 23. The speakers on the program will include Drs. Charles T. Obermann, Cherokee, "The Problem Drinker," and James F. Kelly, Omaha, "Some Recent Advances in Radiation Therapy"; others will include Drs. George B. Eusterman, Rochester, Minn.; Rollin Russell Best and William R. Hamsa, Omaha; James H. Bloomfield, Chicago, and Orval R. Withers, Kansas City. The clinics will cover practical surgery, office management of some surgical conditions of the extremities, gynecology, clinical allergy and gastrointestinal malignant conditions. There will also be an after-dinner symposium on medical economics.

Society News.—Dr. Clarence E. Broderick, Cherokee, addressed the Cherokee County Medical Society April 11 on "Interstitial Keratitis of the Cornea."——At a meeting of the Crawford County Medical Society in Denison April 12, the speakers were Drs. Robert D. Schrock, Omaha, on "Fractures of the Lower Third of the Forearm and Wrist" and James W. Graham, Sioux City, "Fractures About the Elbow."——Dr. Goronwy O. Broun, St. Louis, discussed "The Problem of Arteriosclerosis" before the Scott County Medical Society in Davenport April 5.——At a meeting of the Tama County Medical Society in Dysart April 21 Dr. Milo G. Meyer, Marshalltown, spoke on psychoneurosis.——The Four County Medical Society (Allamakee, Clayton, Fayette and Winneshiek) was addressed at Postville April 5 by Drs. Arthur B. Hunt and John M. Waugh, both of Rochester, Minn., on sterility and surgery of the female pelvis, respectively.

KANSAS

Medical Books in High School Library.—Fifty-two books on medical and public health were recently placed in the Hoisington High School by the Barton County Medical Society. The books were selected by a committee of the society in cooperation with a local library committee and the cost was defrayed by a bequest in the will of a local citizen. The books were selected from a list prepared by the Kansas Women's Auxiliary.

MAINE

Personal.—Dr. Oscar R. Emerson, Newport, has been appointed a member of the state board of registration of medicine succeeding Dr. Franklin A. Ferguson, Portland, resigned. Dr. Ferguson was also chairman of the board, and a successor will be elected at a meeting in July.

Anniversary of Memorial Library.—The Frederic Henry Gerrish Memorial Library observed its first anniversary with a special ceremony May 26 at the Central Maine General Hospital, Lewiston. The program included clinics, ward walks and a round table discussion by Dr. Reginald Fitz, Wade professor of medicine, Boston University School of Medicine. At the banquet in the evening, Dr. Ralph W. Wakefield, Bar Harbor, president, Maine Medical Association, spoke and Dr. Fitz discussed "The Case of the Forsaken Pamphlet."

Society News.—The Cumberland County Medical Society was addressed April 22 by Dr. Henry R. Viets, Boston, on "Acute Lymphocytic Meningitis and Other Virus Diseases of the Nervous System."——Dr. Samuel H. Proger, Boston, addressed the Kennebec County Medical Association in Gardiner April 21 on "The Heart After Forty." Dr. Ralph W. Wakefield, Bar Harbor, also spoke.——Dr. Arthur W. Allen, Boston, discussed "Peptic Ulcer" before the Penobscot County Medical Association in Bangor April 18.——Dr. Harold E. Pressey, Bangor, discussed "Some Physiotherapy Methods in Modern Medicine" before the Waldo County Medical Society May 26.

MICHIGAN

Graduate Course in Obstetrics.—The federal maternal welfare committee, through the state department of health and the department of graduate medicine, University of Michigan, Ann Arbor, is sponsoring a graduate course in obstetrics at the University Hospital. Two practicing physicians have been appointed for intervals of two weeks during which time they live in Maternity Hospital. The following were appointed by the directors of the Michigan Maternal Welfare Committee: April 18-30, Drs. Clark G. Porter, Traverse City, and Fred E. Murphy, Cedar; May 2-14, Drs. Wesley H. Mast, Petoskey, and Gilbert B. Saltonstall, Charlevoix; May 16-28, Drs. Clarence G. Clippert, Grayling, and Benton A. Holm, Cadillac; May 30-June 11, Drs. Michael R. Murphy, Cadillac, and Raphael W. Albi, Lake City; June 13-25, Drs. Hugh F. Mullenmeister, Bear Lake, and Ernest C. Hansen, Manistee.

Personal.—Dr. Anthony J. J. Rourke, New York, has been appointed assistant director of University Hospital, Ann Arbor, succeeding Mr. George P. Bugbee, who resigned to become superintendent of the Cleveland City Hospital. Dr. Rourke graduated at the University of Michigan Medical School.——Dr. Milton Shaw, Lansing, immediate past president of the Ingham County Medical Society, was recently presented with a silver tray on which was engraved the signature of every member of the society in appreciation of his services.——Life membership in the Bay County Medical Society was conferred on Dr. Charles H. Baker, Bay City, at its meeting May 25. Dr. Baker was president of the Michigan State Medical Society in 1919.——Dr. George C. Stucky, for thirteen years superintendent of the Ingham County Tuberculosis Sanatorium, Lansing, has resigned to work on a rural health project being conducted in seven counties by the W. K. Kellogg Foundation, Battle Creek.——Dr. Wayne S. Ramsey, Harrisburg, Pa., president of the Washtenaw County Medical Society in 1934, is the new secretary of the Michigan Crippled Children Commission.——Dr. Richard M. Johnson, assistant professor of medicine, Wayne University College of Medicine, Detroit, has been appointed medical director of Eloise Hospital, Eloise.

MINNESOTA

Society News.—At a meeting of the Washington County Medical Society, April 12, Dr. Carl L. Larsen, St. Paul, discussed sinus disease.——At a meeting of the Minnesota Academy of Medicine in St. Paul May 11, the thesis of Dr. Emmett V. Kenefick was entitled "Nontuberculous Spontaneous Pneumothorax."

Personal.—Dr. Carl C. Chatterton during April was awarded the International Distinguished Service Medal for 1937 by the Cosmopolitan Club of St. Paul for his work with crippled children at the Gillette State Hospital. The medal is given each year to a resident of the city who during the past twelve months has rendered noteworthy and unselfish civic service without remuneration.

University News.—The board of regents of the University of Minnesota announces a gift of $10,000 from Mrs. John Dwan, the mother of Dr. Paul F. Dwan of the department of pediatrics, for the inauguration of a serum center at the university. A gift of $7,300 was also announced from the Citizens Aid Society, Minneapolis, for the purchase of an additional roentgen therapy machine for the Cancer Institute.

NEW HAMPSHIRE

Personal.—At a meeting of the Strafford County Medical Society in Rochester, April 27, the following were made honorary members: Drs. Roscoe G. Blanchard, Dover, Louis W. Flanders, Dover, John H. Bates, East Rochester, and Forrest L. Keay, Rochester. Dr. Samuel F. Marshall, Boston, discussed acute conditions of the abdomen.

Society News.—Dr. Dwight O'Hara, Boston, addressed the Dover Medical Society May 5 on "Scarlet Fever and Streptococci."——At a meeting of the Rockingham County Medical Society at Portsmouth recently Dr. James Sanders, among others, spoke on "Traumatic Injuries of the Extremities."——Dr. Halsey B. Loder, Boston, discussed "Emergency Treatment of Conditions That Arise in General Practice" before the Belknap County Medical Society in New Hampton April 5.

NEW JERSEY

Adler Prize Awarded to Dr. Stanley.—Harvard University, Cambridge, has awarded the Isaac Adler Prize of $2,000 to Wendell M. Stanley, Ph.D., Rockefeller Institute for Medical Research, Princeton, for his work on the isolation of a

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crystallizable factor which has developed a new approach in the study of viruses and stimulated a widespread interest among workers in this field, according to the New York *Times*. The Adler Prize was founded in 1934 by a bequest of $20,000 made by Mrs. Frida Adler, New York, in memory of her husband. Dr. Stanley was recently awarded the Rosenberger Medal of the University of Chicago for his work on viruses.

Vineland School Fifty Years Old.—The Training School at Vineland, an institution for mentally deficient children, recently celebrated the fiftieth anniversary of its founding. Mr. Edward R. Johnstone has been director since 1900. In 1906 the research laboratory was established with Henry H. Goddard, Ph.D., now of Ohio State University, as the director. Under his direction the Binet intelligence test was first used in the United States, it is said, and it was at Vineland that he produced his book "The Kallikak Family." Edgar A. Doll, Ph.D., is now director of the laboratory. A special study of birth injuries has been made in the past five years with the cooperation of the New Jersey Crippled Children's Commission and the federal Children's Bureau.

NEW YORK

Compulsory Examination for License to Marry.—A law has been enacted requiring a physician's examination and serologic test of each applicant for a marriage license in New York. The law went into effect immediately but is not applicable to marriage licenses issued before July 1.

Society News.—Dr. Charles H. Goodrich, Brooklyn, president of the Medical Society of the State of New York, addressed the Medical Society of the County of Albany April 27 on "Our Position, Our Responsibilities and the Outlook."——Dr. Wilson G. Smillie, New York, addressed the Medical Society of the County of Nassau, Mineola, April 26, on "The Present Day Concept of Public Health."

Outbreaks of Gastroenteritis.—Ninety-four persons were affected in an outbreak of gastroenteritis in East Pembroke, Genesee County, between February 23 and March 7. The illness was traced to a well which supplied water for a school in which most of the cases occurred. The remaining cases were in households near the school which also used the water. Bacteriologic examination showed B. coli.——Forty-three out of forty-five persons who attended a church supper in the town of Brasher, St. Lawrence County, March 24, became ill of gastroenteritis.

Conference of Health Officers and Public Health Nurses.—The annual conference of health officers and public health nurses will be held at Saratoga Springs, June 28-30. According to the preliminary announcement, the speakers will include Gov. Herbert H. Lehman, Drs. Edward S. Godfrey Jr., Albany, state commissioner of health; William A. Groat, Syracuse, president of the Medical Society of the State of New York; Ludvig Hektoen, executive director, National Advisory Cancer Council, Washington, D. C.; Paluel J. Flagg, New York, chairman of the committee on asphyxia of the American Medical Association, and Louise Pearce, Princeton, N. J., of the Rockefeller Institute for Medical Research.

New York City

The Graduate Fortnight.—The eleventh annual Graduate Fortnight of the New York Academy of Medicine will be held October 24 to November 4, it is announced. This year's subject will be "Diseases of the Blood and Blood-Forming Organs." All members of the medical profession are invited to attend. Information may be obtained from Dr. Mahlon Ashford, New York Academy of Medicine, 2 East One Hundred and Third Street, New York.

Society News.—At a meeting of the Association for the Advancement of Industrial Medicine and Surgery, Inc., May 18, the speakers were Drs. Arthur M. Master on "Precipitating Factors in Coronary Artery Thrombosis"; Louis Faugeres Bishop Jr., "Cardiovascular Syphilis in Industry," and Abram Wilbur Duryee, "The Peripheral Vascular System."——A symposium on the endocrine glands was presented at a meeting of the International Spanish Speaking Association of Physicians, Dentists and Pharmacists recently by Drs. Frank H. Lahey, Boston; Michael G. Wohl, Philadelphia; Andre Crotti, Columbus, Ohio, and William Seaman Bainbridge.

Dr. Tillett Made Professor of Medicine.—Dr. William Smith Tillett, professor of bacteriology and director of the bacteriologic laboratories, New York University College of Medicine, has been appointed professor of medicine to fill the vacancy created last year by the death of Dr. John Wyckoff. The appointment is effective in the fall. A native of Charlotte, N. C., Dr. Tillett graduated at Johns Hopkins University School of Medicine, Baltimore; he served overseas during the World War and then joined the staff of the Rockefeller Institute for Medical Research. Prior to his appointment at New York University, Dr. Tillett served as associate professor of medicine and director of the biologic division of the department of medicine at Johns Hopkins.

Library Report.—The annual report of the library of the Medical Society of the County of Kings and the Brooklyn Academy of Medicine shows that 16,570 readers used the library during 1937. The number of books consulted in the library was 64,511 and the number taken home was 12,702. All these figures were increases over the previous year. This library receives support from numerous special societies, some of which use the society's building for their meeting. A number of organizations and individuals present subscriptions to periodicals to the library. The report points to a serious need for expansion of space to accommodate its growing collections. The library purchased 951 volumes, received for review 452 and received as gifts 168. The number of current serial publications received was 1,562.

New York Hospital and Cornell Seek Endowment.—The New York Hospital and Cornell University Medical College began a campaign March 31 for an endowment of $17,000,000 to enable the institution to use its facilities and enlarge its program of research. It is said that the annual deficit has been reduced by two thirds through careful management, but that further curtailment would impair the service to patients and the facilities for research and education. The present annual operating loss of nearly a million dollars is caused by the free and partly free care of patients, it was said. Urgent requirements of the hospital are additional beds in the department of medicine, initial development of surgical specialties, opening of unused floors and an endowment for the school of nursing. In the college the departments are existing at the lowest level consistent with first class teaching, an announcement said. Last year the hospital cared for 20,000 bed patients and 46,000 in the outpatient department. The total operating expenses for the year were $3,879,674.86.

NORTH CAROLINA

Health Officer Honored.—Dr. George M. Cooper, assistant state health officer since 1923 and director of the division of preventive medicine and health education, state department of health, Raleigh, was recently presented with a silver letter opener bearing his initials and the dates 1915-1938 by his associates in the division. The gift was in recognition of his service with the state board for twenty-three years.

District Meetings.—The Eighth District Medical Society was addressed in Greensboro April 26, among others, by Drs. Fred M. Patterson, Greensboro, on "Surgery of the Prostate, Preoperative Studies and Preparation"; Robert W. Mathews, Greensboro, "Classification and Mechanism of the Anemias," and Charles L. Haywood Jr., Elkin, "The Erythrocyte Sedimentation Rate in the Acute Abdominal Conditions."——At a meeting of the Fifth District Medical Society in Sanford April 26, the speakers included Drs. Maurice Barnes Woodhall, Durham, on "Diagnosis and Treatment of Acute Head Injuries," and Asa M. Lehman, Fort Bragg, lieutenant colonel, U. S. Army, "Intestinal Obstruction."

NORTH DAKOTA

Personal.—Dr. Clyde E. Stackhouse, Bismarck, has been appointed medical referee of the North Dakota State Board of Public Welfare, succeeding Dr. William H. Bodenstab, Bismarck.——Dr. Oliver S. Craise, Towner, has been appointed superintendent of the McHenry County Board of Health.——Dr. Robert Gillam White, formerly of Ann Arbor, Mich., has been appointed in charge of a new district branch of the North Dakota State Department of Health with headquarters at Valley City.——Dr. Francis Weldon Ford, Minnewaukan, has been appointed health officer of Devils Lake.

PENNSYLVANIA

Personal.—Dr. Edwin A. Nicodemus, who recently retired as chief of the surgical staff of the Harrisburg Polyclinic Hospital, was recently honored with a testimonial dinner at the Hotel Harrisburger by members of the staff.

Society News.—At a meeting of the Lycoming County Medical Society in Williamsport June 10 Dr. Samuel O. Pruitt, Philadelphia, spoke on "Prognosis and Management of the Average Case of Tuberculosis."——At a meeting of the Fayette

County Medical Society in Uniontown June 2, Drs. Harold L. Mitchell, Pittsburgh, discussed mental health problems and Charles H. Henninger, Pittsburgh, mental hygiene activities in Pennsylvania. —— The Dauphin County Medical Society, Harrisburg, was addressed June 7 by Dr. John C. Hirst, Philadelphia, on "Maternal and Fetal Complications of Multiple Pregnancies."

TEXAS

State Medical Election. — Dr. Leopold H. Reeves, Fort Worth, was chosen president-elect of the Texas State Medical Association and Dr. Ernst W. Bertner, Houston, was inducted into the presidency. Vice presidents are Drs. Lewis B. Holland, Wichita Falls; James W. Ward, Greenville, and Frederick B. Shields, Victoria. Drs. Holman Taylor and Khleber H. Beall, both of Fort Worth, were reelected secretary and treasurer respectively. The 1939 session will be in San Antonio.

Society News.—Drs. Robert M. Purdie and John R. Phillips, Houston, addressed the Austin County Medical Society, Sealy, recently, on "Indigestion as a Symptom" and "Ulcer and Carcinoma of the Stomach and Duodenum" respectively. ——Drs. Charles W. Stevenson and Julius A. Heyman, Wichita Falls, addressed the Childress-Collingsworth-Hall Counties Medical Society, Memphis, recently, on "Gastrointestinal Diagnosis" and "Peritonitis and Its Treatment" respectively. ——Speakers at a meeting of the Falls County Medical Society recently were the following from San Antonio: Dr. Lewis M. Helfer, on "Diagnosis of Brain Tumors"; William E. Durbeck, D.D.S., "Fractures of the Jaws" and Dr. John D. Gleckler, "Tic Douloureux." —— Drs. Richard B. DeLee, Shreveport, La., and Walter Grady Reddick, Dallas, addressed the Gregg County Medical Society, Longview, March 10, on "Treatment of Hay Fever" and "Use of Sulfanilamide in Internal Medicine" respectively.——A symposium on diseases of the liver was presented before the Tarrant County Medical Society, Fort Worth, March 1, by Drs. Hiram C. Thomas, Clarence C. Garrett, Frank W. Halpin and Charles H. McCollum Jr.

WEST VIRGINIA

Annual Symposium.—The fourth annual symposium, presented by the Golden Clinic, Davis Memorial Hospital, Elkins, will be held June 25. The speakers will include:

Dr. Harry E. Mock, Chicago, Skull Fracture.
Dr. George K. Fenn, Chicago, Peripheral Circulatory Failure versus Myocardial Failure.
Dr. Fred H. Albee, New York, Massive Resection of Bone Sarcoma with Immediate Bone Graft Replacement.
Dr. Lester Hollander, Pittsburgh, Dermatologic Problems of the General Practitioner.

The West Virginia Heart Association will hold a round table luncheon. Dr. John E. Cannaday, Charleston, will be the toastmaster at the banquet in the evening; the speakers will be Drs. Mock and Albee on "Conservative Treatment of Gallbladder Disease" and "Joint Reconstruction" respectively.

WISCONSIN

Society News.—Dr. Hans Adolph Krebs of the department of pharmacology, University of Sheffield, England, lectured before the University of Wisconsin Medical Society April 25 on "Recent Advances in Intermediary Carbohydrate Metabolism."——The Medical Society of Milwaukee County was addressed May 13 by Drs. Dexter H. Witte on "What Is Socialized Medicine?" and Newell C. Gilbert, Chicago, "Role of the Coronary Circulation in Cardiac Insufficiency." A school of first aid and health was conducted during May by the local chapter of the American Red Cross in conjunction with the first aid committee of the society.

PHILIPPINE ISLANDS

New Officers of Philippine Medical Association. — Dr. Jose C. Locsin, Silay, Occidental Negros, was elected president of the Philippine Islands Medical Association at its thirty-fifth annual meeting in Zamboanga, April 27-29. Vice presidents are Drs. Pedro A. Rodriguez, Zamboanga, and Alberto Tupas, Manila, and Dr. Antonio S. Fernando, Manila, is secretary. The program included the following speakers:

Dr. Tupas, The Care of the Premature Infant in the Tropics.
Drs. Mariano C. Icasiano and Florencio Z. Cruz, Manila, The Normal Growth of Filipino School Children.
Dr. Teofilo S. Morales, Baguio, Artificial Pneumothorax in the Treatment of Lobar Pneumonia.
Drs. Lucio D. Abad and Manuel C. Magboo, Manila, Foreign Body in the Frontal Sinus (Spark-Plug of an Automobile) of Fifteen Years' Duration.
Dr. Antonio Ejercito, Manila, Biological Control of Anopheles.

GENERAL

Campaign Against Fourth of July Accidents.—How to make the Fourth of July safe and sane is the theme of literature now being distributed by the National Society for the Prevention of Blindness in its current campaign to reduce Fourth of July accidents. The material contains suggestions for editorial writers and mothers and includes a reprint of the first annual summary of Fourth of July accidents, published in THE JOURNAL, Nov. 27, 1937, page 1806.

Changes in Status of Licensure. — The State Medical Board of Ohio reports the following actions:

Dr. Phares P. Mauk, Portland, Ore., license revoked recently for violation of the Harrison Narcotic Act.
Dr. Robert I. McPhail, formerly of Arcadia, license restored January 3; it was suspended in January 1937.

The Texas State Board of Medical Examiners reported the following:

Dr. Richard Hubbard Lindley, San Angelo, license suspended for two years by order of the district court January 5.

The department of licenses of the state of Washington recently reported the following:

Dr. Robert William Rose, Davenport, license revoked Dec. 17, 1937, for unprofessional conduct.

Special Society Elections.—At the semicentennial meeting of the American Pediatric Society in Great Barrington, Mass., May 7, Dr. Clifford G. Grulee, Evanston, Ill., was elected president; Dr. DeWitt H. Sherman, Buffalo, vice president, and Dr. Hugh McCulloch, St. Louis, reelected secretary.—— Dr. Ernest H. Gaither, Baltimore, was elected president of the American Gastro-Enterological Association at its recent annual meeting and Drs. Irvin Abell, Louisville, Ky., and Andrew C. Ivy, Chicago, vice presidents. Dr. Russell S. Boles, Philadelphia, is secretary. The 1939 session will be held at the Hotel Claridge, Atlantic City, May 1-2.——Newly elected officers of the American Otological Society include Drs. Isidore Friesner, New York, president, and Horace Newhart, Minneapolis, vice president. Dr. Thomas J. Harris, New York, is secretary.

Restrictions Removed from Rockefeller Gifts.—Trustees of the Rockefeller Foundation and the General Education Board, also financed by Rockefeller funds, recently announced that gifts distributed by them are now free from restrictions as to their use for specific purposes. It was pointed out that the new purposes should be as reasonably related to the original purpose as may be found practicable, having regard to intervening changing conditions. The following conditions, however, were made for the change: Ten years after the date of a gift the income may be used for some purpose other than the original one; five years after the date of the gift 5 per cent of the principal may be used each year for any purpose for which the income may then be used; after twenty-five years any part or the whole of the principal may be used for some other purpose. This action was taken in view of the impending liquidation of the General Education Board, it was announced, and uncertainty as to further opportunities for expenditure by the Rockefeller Foundation. The Laura Spelman Rockefeller Memorial and International Education Board have already been merged or liquidated.

Reports of Swindlers.—A man has recently been using the name of Dr. Malcolm T. MacEachern, associate director of the American College of Surgeons, Chicago, to swindle physicians and hospitals, it is reported. This man tells a story of having lost his wallet or having his car broken down and wants to borrow money to get him out of his difficulties. He speaks familiarly of physicians and appears to be well versed in matters pertaining to medicine. He is between 40 and 50 years old, about 5 feet 8 inches tall and weighs about 165 pounds; has a fair complexion, sandy hair; is well groomed and talks rapidly and suavely. It is also reported that persons are visiting hospitals posing as representatives of the American College of Surgeons. One such reported from Waynesburg, Va., gave the name Robert T. Clayton. He also claimed a connection with the American Medical Association. Accredited representatives of these organizations carry identification which they will produce on request.——A Kentucky physician has reported the activities of a man using the name Walter S. Cole, who claims to be an advertising agent. His plan was to solicit physicians to have their names on key tags or cards for hotel rooms as "house physician." This practice is customary in that section, it was said. Mr. "Cole" gave a receipt for payment for handling this service, but when a letter was sent to the address he gave, 1472 Broadway, New York, the letter was returned marked "Fictitious."——A trail of bad checks was recently left in Marseilles, Ill., by a man who

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posed as a physician giving the name Dr. George E. Knight, Detroit. He rented an office, ordered an automobile and joined in social activities in the town. He asserted that he had opened an account in Grand Ridge, a neighboring town, but when various persons who had cashed his checks attempted to cash them in Grand Ridge it was found the man had no funds there. He was described as about 35 years old, 6 feet tall, blond and slightly bald. Files of the biographic department and the Bureau of Investigation of the American Medical Association do not show a physician of this name.

CANADA

Personal.—Dr. Brabazon J. Hallowes has been appointed health officer of Alexis Creek.——Dr. Donald H. Williams, Vancouver, has been appointed director of the division of venereal disease control of the department of health of British Columbia.

Banting Chairman of Research Committee.—The National Research Council of Canada has recently appointed a committee to study the organization of medical research in Canada, with Sir Frederick Banting, Toronto, as chairman. The immediate purposes of the committee were stated to be: to receive suggestions for requirements in respect of medical research and in matters related thereto; to consider by whom the investigations required can best be carried out and to make proposals accordingly; to correlate the information when secured and to make it available to those concerned, and to do such other things as the committee may deem advisable to promote research. One of the first steps will be to make a survey of the work in progress at various centers to determine how the activities of the various institutions concerned may be developed to the best possible advantage, according to *Science*. Appointment of the committee was recommended at a nationwide conference held recently in Ottawa and attended by representatives of all the medical schools, organizations and institutions concerned in medical research in the dominion.

FOREIGN

Health Survey in Belgium.—The Health Committee of the League of Nations at a meeting in February agreed to cooperate with the Belgian Ministry of Health in making a survey of health conditions of the population and of the equipment, organization, methods and efficiency of the health services of Belgium. The action was taken in answer to a request of the ministry of health, of which Dr. Rene Sand is secretary general. A committee was appointed to make the survey with Professor Parisot, Paris, as chairman, to make the study early in the summer.

Manson Medal to Sir Leonard Rogers.—The Royal Society of Tropical Medicine and Hygiene presented its Manson Medal to Major General Sir Leonard Rogers, retired, at its annual meeting June 16. The medal is awarded triennially "to the living author of such work in any branch of tropical medicine or tropical hygiene as the council may consider deserving of the honor." Sir Leonard formerly served as president of the society and as professor of pathology at the Medical College, Calcutta. He received the Moxon Gold Medal of the Royal College of Physicians of London and the Fothergillian Gold Medal of the Medical Society of London. He has been a frequent contributor to the literature on tropical medicine.

Government Services

Annual Report of Surgeon General of Navy

The Bureau of Medicine and Surgery of the U. S. Navy in its report for the calendar year 1936 listed 367 deaths from all causes, a rate of 2.95 per thousand. Motor vehicle accidents occupied first place as a cause of accidental death, as it did in 1930, 1931, 1934 and 1935. Previous to 1930, drowning was the leading cause of accidental death.

There were 55,614 admissions for all causes in the calendar year 1936, with a rate of 447.03 per thousand. Fifty-two of the fifty-six deaths and 712, or 88.3 per cent of the admission charged to motor vehicles, were the result of injuries received while the men were on leave or liberty. Of the 806 motor vehicle injuries, 620 were incurred in passenger-carrying automobiles, 112 in motorcycles, fifty-one in trucks and twenty-three in other motor vehicles. There were 1,876 admissions for accidental injuries and poisoning incurred while on leave or liberty. When considered from the point of view of loss of life or serious injury to naval personnel it can be said that only one disaster occurred during the year 1936. A gun explosion occurred on the U. S. *Marblehead* July 28, injuring eleven enlisted men. Three deaths and three "invaliding from the naval service" resulted from this explosion. There were fifty-one instances of suicide and attempted suicide with twenty-nine deaths, a decrease of seven and seven respectively as compared with 1935. In 1936 there were 1,322 persons invalided from the service. Of the total 1,141,908 sick days for the navy in 1936, naval hospitals were charged with 841,295, or 73.7 per cent. This number of hospital sick days, incurred by 23,347 active duty patients, represents 1.85 per cent of all naval personnel as constantly under treatment in naval hospitals throughout the year. In addition there were 46,299 sick days for 2,154 patients on the hospital ship U. S. S. *Relief;* 3,905 sick days for twenty tuberculous patients at the naval unit, Fitzsimons General Hospital, U. S. Army, Denver, and 10,013 sick days for eighty-eight insane patients at the naval unit at St. Elizabeth's Hospital, Washington, D. C. A total of 23,347 persons in the navy, 5,195 Veterans' Administration patients and 7,690 supernumerary patients underwent treatment in naval hospitals, or a grand total of 36,232 persons treated in naval hospitals with 1,259,541 sick days. There were 187 original admissions for malaria and three cases of tularemia. The admission rate for communicable diseases transmissible by oral and nasal discharges was 142.47 per thousand for 1936.

Venereal diseases occupied second place among all causes of morbidity and contributed the largest number of sick days of any group. This group has maintained this position since 1925, except for the year 1930. The admission rate for 1936 was 65.49 per thousand, 12 per cent less than for 1935. There were 1,213 cases of chancroidal infections, 5,453 cases of gonococcic infections, 1,377 cases of syphilis, 102 cases of venereal lymphogranuloma and three cases of verruca acuminata (venereal), or a total of 8,148 cases admitted during the year. During the past twelve years infections acquired prior to enlistment have not been included in the admission rate. There were 158,920 sick days reported for these diseases. The noneffective ratio, or the daily average number of persons on the sick list, was 348.99 per hundred thousand, 5 per cent less than for 1935.

The admission rate for all forms of tuberculosis was 136 per hundred thousand as compared with 131 in 1935. In addition to 169 original admissions representing disease acquired in the naval service in 1936 there were seventy-five cases remaining from the previous year, five readmissions, nine in which the disease or condition was a complication or sequel of some other condition, and five cases in which the disability was reported as existing prior to enlistment. All forms of tuberculosis were responsible for 34,536 sick days, or a daily average of 76 per hundred thousand patients constantly on the sick list.

The medical corps numbered 781 medical officers at the end of the fiscal year, June 30, 1937, which number is short of the number required, the report said. Although appropriation was made for 1938 for 851 officers, that number is still too small. During the fiscal year 1937 twenty medical officers received graduate instruction at the Naval Medical School, Washington, D. C., at the Marine Barracks, Quantico, Va., and at the Edgewood Arsenal, Edgewood, Md. In addition forty officers, eight nurses and five enlisted men took graduate work at various universities.

There is a continued shortage of qualified flight surgeons. One officer received training during the fiscal year at the Army School of Aviation Medicine, Randolph Field, Texas; five had been assigned for the present year. One flight surgeon each year completes the basic flying course at the Naval Air Station, Pensacola, Fla.; there are now four so qualified. Sixteen flight surgeons had flight orders on duty with active flying units.

The Naval Dispensary, which renders professional service to officers and men and their families in the District of Columbia and vicinity, reported 42,687 office calls and 11,915 house calls, 37,972 prescriptions filled, 8,689 laboratory examinations and 7,784 physical therapy treatments.

CORRECTION

Renal Mobility.—In the paper on this subject by Hess in THE JOURNAL May 28, page 1819, first column, third line from the bottom of the page, the word "prone" should have been "supine."

Foreign Letters

LONDON

(From Our Regular Correspondent)

May 21, 1938.

Shortage of Nurses; Proposals to Improve Their Conditions of Work

Nursing is an arduous profession, but attempts at improvement of the conditions have so far been on a limited scale. The result is that we are faced with a shortage of nurses and reform has become a burning question. The London County Council, which employs 7,000 nurses in its hospitals, has already reduced their working hours from sixty-six to fifty-four per week, and it is now proposed to reduce them to forty-eight. The government appointed a committee to investigate and report on nursing services, to which the British Medical Association has submitted important evidence. They stated that there is an insufficiency of candidates of any type for the nursing profession, and that the shortage will become greater in the near future on account of extension of hospital accommodation, increasing complexity of medical and surgical procedures, and reduction of nurses' hours of work. The shortage appears to be due to the long and arduous training and to the exacting character of the work, with which the salaries are not commensurate. The methods of training and the conditions of service impose many restrictions on the probationer and the qualified nurse. Finally, many more attractive occupations are open to young women. It is generally agreed that hospital training should not begin before the age of 18. This means for many girls a gap after leaving school and beginning to train, so that many girls suited for and attracted to nursing are absorbed into other occupations. The conditions of training are arduous. When the probationer enters the wards her education is generally subordinated to the work of the hospital. She often has to attend lectures at the end of a full day or night of duty and even sit for the final examination on the morning after a night on duty. The examination questions are often outside her province.

The British Medical Association made the following recommendations: 1. Preprofessional training courses should be organized for girls between the ages of 16 and 18. 2. The preliminary state examination should exclude the theory and practice of nursing and consist of questions on anatomy, physiology and hygiene, which it should be possible to study before beginning professional training. 3. It should be possible to establish a group hospital system of training in order to overcome the difficulties of recognizing smaller hospitals for training and to give a more varied type of instruction. 4. A substantial improvement in the conditions of living and pay should be created. 5. There should be recognized a second grade of nurse to act in an assistant capacity.

New Technic for Radium Treatment of Carcinoma of Vulva

At a meeting of the North of England Obstetric and Gynaecologic Society, Dr. F. Ellis, medical director of the Sheffield Radium Centre, reported cases of carcinoma of the vulva in which complete healing had been obtained without necrosis by the use of uniform irradiation. He said that radium treatment had been discredited in the past by the high incidence of radium necrosis and local recurrences. However, modifications of the technic which insured more uniform irradiation of the growth had so transformed the outlook that radium could now compete with surgical measures. The most important modification was nursing the patients in the same posture as was adopted for insertion of the radium. The radium needles then retained their position throughout the treatment, and "crowding" after return of the patient to bed was avoided. When the growth was at the anterior end of the vulva, the needles were inserted with the patient supine; when the growth involved the posterior end, the left lateral position was adopted, the patient being nursed in the same position; when the entire vulva was involved, the needles were inserted and nursing was carried out with the patient in the lithotomy position. When needles had to be placed on the surface of the growth, rubber pads were used to protect adjacent cutaneous surfaces and to keep the needles at known distances from the growth. After insertion of the needles a perforated rubber dressing was placed over the vulva, and irrigation with eusol (lime, 25 Gm.; sublimed sulfur, 50 Gm.; distilled water, q. s. ad 1,000 cc.) was done twice daily; an indwelling catheter was necessary. The best results were obtained when all the needles were placed 1.5 cm. apart. The theoretically better distribution, with the peripheral needles only 1 cm. apart (in which the periphery of the growth received half as much radiation again as the center) had not given such good results. The total dose ranged between 4,500 and 7,000 roentgen units. When interstitial irradiation of the glands was necessary, two planes of radium, 2 cm. apart, had to be used if any of the glands had a diameter of more than 1 cm. Important in the after-treatment was avoidance of hot baths and ointments. For the desquamation stage gentian violet was the best application. Moist desquamation was treated with 0.5 per cent solution of silver nitrate. Necrosis and residual carcinomatous areas called for excision.

Dr. Ellis distinguished five stages in the cases treated: (1) operable primary growths; (2) operable primary growths with movable glands; (3) operable growths; (4) recurrence after treatment; (5) hopeless conditions. In 1935 nine patients were treated; the three patients in stage 1 were still alive and free from disease, and the remaining six died. In 1936 fourteen patients were treated; four were in stage 1 and were alive and free from disease, and two of four in stage 2, one in stage 3 and one in stage 4 were alive. Radium had the advantages over surgical intervention of absence of shock and operative mortality, minimum damage to the urethra and wider application in advanced stages. However, operation eliminated necrosis; there was possibly less subsequent discomfort; precancerous tissues were removed, and there was the possibility of removing affected iliac glands.

BERLIN

(From Our Regular Correspondent)

April 26, 1938.

Influence of Flying on the Circulation

The physiology and clinical aspects of aviation are considered of great importance in Germany and they are in process of thorough investigation. A discussion of this theme, by Docent Dr. G. Schlomka of Bonn, recently appeared in *Medizinische Klinik*. Both the peripheral and the central circulation are greatly influenced by flying. The special demands made by flying are based on two factors, speed and altitude, which differ fundamentally in one respect: altitude influences the circulation directly through diminished oxygenation of the blood, whereas the effect of speed is vastly more indirect. The speed factor is based on centrifugal force, always present whenever the course of the aircraft is altered. The entire organism of the flier is exposed to the same centrifugal forces as the ship. The circulation, however, possesses a certain peculiarity with respect to these forces; the vascular walls, especially those of the veins and capillaries, are especially pliant. Consequently the peripheral blood stream yields to the increase in hydrostatic internal pressure induced by the centrifugal force; this increase takes the form of a transverse dilatation of those vessels which are distal to the point of rotation. Since the blood volume is diminished, however, this means that blood in more or less considerable quantities will be transported peripherad. Owing to the great capacity of the abdominal circulation and the centrifugal speed, which in flying usually exerts its influence distad, large quan-

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tities of blood will descend into the lower half of the body, with more or less complete emptying of the vessels of the upper half. Some vasomotor collapse will occur. The observations of different investigators of this problem are at variance. Many authors say that aerial travel increases the blood pressure, while others have observed that pressure is lowered during flight. The experimental data on the effect of centrifugal force on animals cannot unreservedly be applied to human beings although in some respects the correspondence is complete. The burden placed on a flier's circulation by the influence of altitude is also obscure. It is generally assumed that the altitude influences the circulation indirectly through the lowering of the pressure of the oxygen in the atmosphere and by the inhibition of oxygenation in the pulmonary blood supply. It has not been satisfactorily explained whether the manifestation of "early collapse" is participated in more by the peripheral circulation or by the heart. The effects of the hypoxemia on a damaged heart muscle will be manifested much earlier than if the heart is healthy. The practitioner should in general consider flying contraindicated for patients with ailments suggestive of angina pectoris, or coronary sclerosis or myocarditis. A trip that would entail flying at an elevation above 1,500 or 2,000 meters is particularly to be interdicted.

Cellular Metabolism and Inflammation

The Berlin Society of Physiology recently discussed the problem of cellular metabolism and inflammation. Professor Lohmann, who represented physiologic chemistry, based his observations on experimental studies. Inflamed cells are damaged body cells and possess marked functions of respiration and of aerobic glycolysis. At the site of the inflammatory process, physicochemical changes occur which are conditioned by the concentrations of oxygen, carbonic acid, lactic acid, bicarbonate and hydrogen ions. Lohmann described the reactions of normal and abnormal metabolism to these altered chemical concentrations. Cellular respiration is independent of the diminution of the sugar and bicarbonate values, as well as of the decrease in the p_H, whereas the aerobic glycolysis is completely dependent on each of the three factors. Since normal body cells have only the function of respiration without aerobic glycolysis, they maintain their undamaged metabolism until the onset of anaerobiosis; damaged cells, on the contrary, and this includes the normal blood cells and therefore the leukocytes of exudates, exhibit, under conditions of inflammation, a reduction in the aerobic glycolysis that may progress to the point of complete disappearance. The respiration alone will then remain and the cells apparently regain a normal metabolism. Examination of isolated muscle shows that inflammation renders the tissue incapable of function. Inflammation is a defense reaction of the organism.

Dr. H. Druckrey, assistant at the Berlin Institute of Pharmacology, the second speaker, discussed the metabolism of damaged tissues from the pharmacologic standpoint. Pharmaceutic substances may exert an important effect on "damaged" tissue. If metabolic conditions occur which differ from those of "normal" tissue, one may expect quantitative and qualitative differences in pharmacologic effect. Since most drugs participate in the normal metabolism, some may become detoxicated and others may first become toxic through collaboration with the metabolic processes. One important fact elicited by previous investigators is that nonspecific lesions induce first of all an increased metabolic rate. Furthermore, one may ask whether this increased metabolic rate following injury may not be evaluated as a manifestation of an increased functional capability of the cells. To clarify this problem, damaged cells were submitted to a second injury. These cells, despite the increased metabolism, were observed to be far less resistant than normal cells, the respiration of which was considerably less. The second injury was followed by an immediate fall in the metabolic curve. Accordingly, repetition of similar injury elicits under certain conditions an effect completely opposite to that elicited by the initial injury.

AUSTRALIA

(From Our Regular Correspondent)

April 27, 1938.

National Health Insurance for New Zealand

The New Zealand government's proposals for the establishment of a free and universal health service, for the payment of national superannuation commencing at the age of 60 years and for granting increases in most classes of state pensions were outlined by the prime minister in a statement issued April 2. The new schemes are to be financed in part by an increase in the wages tax from 8 pence to 1 shilling in the pound, and what is now known as the unemployment tax will become the social security contribution. The money raised in this way will be subsidized on a pound for pound basis out of general government funds. The list of benefits may be summarized as follows: Institution of a free health service for all classes of the community; payment of superannuation at the rate of 30 shillings a week, with an income allowance of £1 a week from other sources; increase in invalidity pensions from £1 to 30/- a week; payment of sickness benefits at rates to be determined; increase in the children's allowance to recipients of sustenance; increased widows' pensions on a wider classification; institution of orphans' pensions at 15/- a week; increase in family allowances from 2/- to 4/- per child; increase in miners' pensions and war veterans' allowances. The proposals outlined by the prime minister will be placed in detail before the special parliamentary committee which has been set up to advise the government. The prime minister has expressed the opinion that the proposed benefits will provide a condition of security unsurpassed anywhere in the world. The government's intention is to make the scheme operative from April next year.

A COMPREHENSIVE HEALTH SCHEME

The government proposes a "universal practitioner service free to all members of the community who need medical attention." The scheme embraces free hospital and sanatorium treatment, mental hospital care and treatment for the mentally afflicted, medicines and maternity benefits in cash payments including the cost of maintenance in a maternity home. It is proposed to introduce as well the following services when practicable: anesthetic, laboratory and radiology, specialist and consultant, massage and physical therapy, transport to and from hospitals and dental and optical benefits. It is also proposed to provide home nursing and domestic help when the necessary staff has been trained to make such a scheme practicable. The government will provide for extended health education as a continuation of measures to educate the public in the promotion of health and the prevention of disease. Regarding the operation of the system, lists would be issued of the doctors who chose to join the scheme, and people would be able to select the one they preferred, up to a certain limit. The practitioner's panel would, however, be restricted to a specific number, and to some extent he would also be able to choose his patients. The freedom of choice on the patient's part would be restricted only by his nearness to the doctor.

PAYMENTS DURING SICKNESS

The institution of the invalidity pension revealed the fact that there are people who cannot qualify as permanent invalids but for whom some security should be provided. The government's proposal is to establish a sickness benefit, but the rates and conditions will be determined after the parliamentary committee has heard the evidence. It is proposed to cooperate with the friendly societies and to utilize their services for paying this amount to their members. In addition to sickness benefits,

provision has been made for those who were not sick and not invalids but whom illness or injury has rendered incapable of earning a complete livelihood. The government will determine the rates in individual cases according to particular circumstances.

MEDICAL CRITICISM

These proposals of the national health insurance scheme are remarkably at variance with the suggestions offered at the request of the government by the New Zealand branch of the British Medical Association. The profession has consistently advocated that whatever measures were undertaken should be directed toward assisting the people to meet their needs with regard to medical service where these needs press most heavily. The government's proposal of a free general practitioner service provides the one item of medical service to which the people now have the most ready access. It omits the very things—in particular the laboratory and specialist services—which are more difficult to obtain and are essential for the accuracy of diagnosis necessary for the efficiency of the general practitioners' services. The principle of offering assistance to those who cannot fully provide for themselves has been adopted in the pensions scheme, and it is difficult to see why the same principle has not been adopted in the proposal for health insurance. It would appear that in this respect the government's proposals are based on an enthusiasm for a politicosocial ideal rather than on the real health requirements of the people.

The extent to which the proposed general practitioner service differed from the treatment that the New Zealand public was accustomed to expect from the family doctor, the necessity for the inclusion of specialists in the scheme, and the failure of the government to consider adequately the whole question of health administration were points discussed by Dr. Lawrence Ludbrook, who for the past three years has represented the Auckland division of the British Medical Association on health insurance matters. In England the contract of the general practitioner in the insurance scheme is to provide, in effect, such medical advice and treatment as could reasonably be expected from general practitioners as a class. In New Zealand the practitioner provides a service, particularly in the country districts, which is much more comprehensive. It is regarded as part of his daily task to set fractures, perform operations of technical skill and undertake a wide range of the medical and surgical needs of the community. The insurance service is to be available to every member of the community, whether he is a millionaire or a pauper. The British Medical Association considers that there is a considerable proportion of the population which is able and which would prefer to provide a complete service themselves, while others in the more serious calamities of illness are at a disadvantage through lack of free specialist facilities.

It is felt that if finance is limited it would be of much greater benefit to provide a complete scheme for the smaller number of people in the lower income groups, thus enabling them to get general and special attention, than to introduce incomplete proposals covering the whole population. Dr. Ludbrook considers that the general practitioner service in Great Britain has proved to be inadequate, and for twenty-five years attempts have been made to introduce a system of specialist treatment only to find it impossible to catch up with finances. Fears for the standard of attainment and ability on the part of the general practitioner under this system were expressed. There would be little incentive for him to qualify for special work not required by the contracts. With no part for specialists in the insurance scheme and with hospital treatment provided, the increase in the number of patients in the institutions will be enormous, but the government has not yet indicated that there will be any alteration in the present methods of maintenance. In the opinion of medical men, hospitals could be made more efficient and costs could be reduced by the provision in the home of general practitioners' and nursing services.

Another problem arises in the large proportion of the population living in country districts. Here the question of mileage is involved, and it appears that the cost of providing medical attention in the dominion is going to be much greater than in other more closely settled countries. New Zealand provides a large amount of hospital service, but there is no doubt that the system is susceptible of a great deal of improvement, the small country hospitals often being uneconomical and inefficient. It is considered that there was need for a much better coordinated system, but the government had failed to investigate this phase of health administration which, in the opinion of the British Medical Association, was of the utmost importance. A comprehensive long range plan should be drawn up instead of introducing only one aspect at tremendous cost. A general practitioner scheme was merely complementary to other equally important forms of health administration. These should have been given due consideration by an independent and, if possible, nonpolitical body.

PROBABLE COST

It is learned on authority that the increased pensions and the institution of the proposed free health service are likely to cost in the aggregate £16,000,000 annually. The revenue from the wages tax at 1 shilling in the pound is expected to be in the vicinity of £6,000,000, and this will leave a discrepancy of at least £10,000,000, which will require rather more than the pound for pound subsidy mentioned in the government's plan. In the final analysis the pensions and benefits will be paid not by the government but out of the earnings of the able bodied. They are to be taxed at the rate of 2 shillings in the pound (1/- by direct and 1/- by general taxation) for the whole of their working lives, in order to provide for the sick and the indigent. It is considered in New Zealand that one tenth of earnings is a high price to pay for social security, especially for those who keep good health and are successful in their work and who may never get anything in return for their sacrifice but the thought that they have helped those less fortunate. In any case the soundness of the social security scheme will not depend on the government but on the ability and the will of the fit to provide for the unfit and the aged. In New Zealand, at the present time, social security is being narrowed in two ways: first by reducing the demands on the able bodied and second by reduction in their numbers. The government is shortening the working life of the people by raising the school age and reducing the pension age. At the same time the forty hour week decreases their productive activities. The effect in the aggregate must be considerable. If only one end of the calculation is taken, the reduction to 60 years of the pensionable age for men will next year permit about 28,000 to retire on pension. Perhaps 20,000 will be eligible and accept the chance. So 20,000 will be removed from the ranks of the earners and taxpayers to the ranks of the pensioners, already over 100,000 strong in a population of about 1,000,000. From now on, moreover, the numbers of those aged 20-60 will decrease steadily, while the number of those over 60 will increase steadily, owing to the combined effect of the low birth rate and the low death rate. Eighteen years from now there will be 20,000 fewer persons in New Zealand aged 20-24 available for employment than there were in 1936. On the other hand, persons of 60 years of age and over increased between 1926 and 1936 by 50,304 and now comprise more than one in ten of the total population. If persons 20 years of age are to be asked to contribute 10 per cent of their income toward security many years ahead, the scheme must be expected to give security in forty years' time. At present the national income is about £145,000,000, and special and general taxation of 2/- in the pound will yield the £14,500,000 annually presumed to be necessary. But as pen-

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sioners increase while earners decrease, the relation might break down. There is the further question whether national income will remain at present high levels. All contingencies must be looked for and guarded against—changes in the productive powers of those who must support the rest, in the age groupings of the people, and in the economic estimation of the product of their labor.

There is a general feeling in New Zealand that the labor government, with an unparalleled enthusiasm for its cause, is introducing measures at a speed which is faster than the powers of adjustment of the community. This speed savors rather of revolution than of evolution.

The Australian Institute of Anatomy

Prior to 1924 the federal government had expressed regret that the Australian nation did not possess a collection of specimens of the unique and fast disappearing fauna of Australia. Sir Colin McKenzie, who later became the first director of the Institute of Anatomy, presented to the federal government his entire private collection. To provide accommodation for this gift, the Zoological Museum Agreement Act of 1924 provided for the formation of an Australian Institute of Anatomy and the erection of a monumental building at Canberra. In addition to the original collection, other free gifts are on view at the institute. Among them are the Horne-Bowie collection, dealing with the life of the central Australian aborigines and throwing valuable light on the psychology of this Stone Age people; the Burrell collection, which deals with the life history of the platypus and which is unique in the world (the platypus is the link between bird, reptile and mammal); the Milne collection, which is an anthropologic and ethnologic collection dealing with the aborigines of New South Wales and contains many native weapons and implements now unobtainable; the Murray Black collection of anatomic material representative of the aborigines of southern Victoria and the river Murray; the Nankivell collection, illustrating the anatomy of the aborigines of the Murray valley; the Howard University collection, which includes a collection of specimens from Harvard University, representing a carefully worked out epitome of the archeology of the United States and which, together with two rare skeletons of primitive North American Indians, was a good will gift from the university to the Institute of Anatomy; the Sir Hubert Murray collection, dealing with the anthropology of Papua; the Rabaul Ethnological collection, concerning chiefly the ethnology of the mandated territory of New Guinea, and the Basedow collection, which deals especially with the anthropology of central and northern Australia.

The Institute of Anatomy, the first unit of a National University of Australia, has already become the most important center in the southern hemisphere for the study of comparative anatomy and of its application to health and disease. The microscopic specimens of Australian fauna number thousands and are unique in the world. They represent normal mammalian tissues unaffected by disease or domestication, and with these human tissues such as those affected with cancer can be compared. The public is admitted to the two museums of osteology and applied anatomy.

Goiter in New Zealand

The Annual Report on vital statistics of New Zealand has provided evidence of the frequent occurrence of goiter in that country. Hercus and Purves have obtained information on the death rates from thyroid diseases compiled from the death certificates available from 1885 onward. A rising rate from 1889 to 1928 is clearly shown, the mean annual rate, 0.48 per 10,000 population in 1929, being more than nine times greater than the rate in 1889. The female incidence is higher than the male and varies from 3 to 10.8 per 10,000 of the population, with the exception of the period 0-5 years of age, when the male incidence is higher than the female. The average for the whole population for all ages is 5.6. A marked rise is shown at 10-15 years and again at 20-25 years and may be ascribed to the influences of puberty and pregnancy respectively. Toxic was not separated from nontoxic goiter until 1908, when the Bertillon system of classification of deaths was adopted. Thyrotoxicosis is preponderant in the total deaths, and thyrotoxicosis death rates increase up to 70 years of age. Deaths from other diseases of the thyroid are too few for separate analysis. The admissions to public hospitals of all thyroid diseases show a striking increase from 1889 to 1933. Also the rate of increase is at present two and a half times the rate immediately after the war. The present rate is over 5.5 per 10,000 of population. Difficulties of classification in the ward make the constitution of these hospital cases difficult to determine. Exophthalmic admissions show a sharply rising rate, and for the period 1929-1933 represented 57.5 per cent of the total of all thyroid diseases. No data are available as to the distribution of nodular and diffuse nontoxic goiters. No positive correlation is observed between the incidence of goiter and malignant disease of the thyroid in New Zealand. Deaths from cancer of the thyroid are rare and not more than ten a year. Prophylactic measures against goiter have been instituted, but more complete statistical data are necessary to measure their effect.

Industrial Hygiene in Queensland

Recent legislation gave to the director general of health and medical services power to investigate the effect of conditions of work and housing on the health of employees. The director has no power to remedy any defects himself, but he may report them to the department or to the governor in council, so that legislative action may be taken. At the same time the state health department was given control of medical and dental services in schools. This should improve the service for outlying centers, as doctors attached to district hospitals will be able to assist. Restrictions relating to the use of lead paint were extended and power was given to health inspectors to take samples of paint for analysis from any building.

BELGIUM

(From Our Regular Correspondent)

April 23, 1938.

The Health of Adolescent Workers

M. Silvart has published in *Indépendance belge* a review of the medical survey of industrial conditions with special reference to the health of apprentices in the industrial training schools. The survey was started in September 1936 and included 1,774 boys and 484 girls from the urban areas of Brussels, Ghent and Liége. These youths were preparing themselves to be metallurgists, electricians, accountants, dressmakers and so on. Deplorable conditions were brought to light. In one workroom occupied by female apprentices, eighty-one different pathologic defects were observed among eighty of the girls. The most common defects determined were scolioses and the sequels of rickets (forty-one cases), defective vision (ten cases), not to speak of dental caries (sixteen cases) and subnormal body weight (fourteen cases). There was one case of tuberculosis. In a machine shop training school there were seventy-five boy apprentices from 12 to 15 years of age, thirty of whom were of delicate constitution. Moreover, thirty-three boys were affected with scolioses and the sequels of rickets, ten had visual disturbances, and there were thirty-seven miscellaneous defects. The investigators arrived at several conclusions. They declare that "medical supervision of youthful apprentices has been proved indispensable not only from the standpoint of detection of disease but from the standpoint of vocational guidance. The importance of medical examination cannot be exaggerated, for on the contraindications depend all further decisions with respect to which occupation is to be recommended or disapproved." The authors deprecate the present system under

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which applicants for admission are not required to have any medical examination whatever and the degree of physical maturity of a pupil is given no consideration. Children 12 years of age and over are admitted to these schools but in most instances this age is too young. Besides, the courses are very exacting. In the technical school at Liége, with its pathetic list of debilitated pupils, the program is based on forty-five school hours a week. Half of this time is devoted to practical courses, which imply that the boy is kept on his feet at work. The schedule is unrelieved by periods of rest or recreation and no course in physical education is offered. For healthy youngsters of 16 years the regimen would be harsh, but to submit 12 year old children, most of them delicate, to such a routine is almost criminal. There are 137 vocational training schools for boys and ninety-seven such schools for girls in Belgium with a total pupil population around 29,000 (21,000 boys and 8,000 girls).

Dr. Peremans, the author of a special report, believes that medical supervision of these schools is of the utmost importance. A suitable service could be assured by the appointment of five full time medical inspectors who would examine thirty children daily for the forty weeks of five days each in the school year. This plan has one disadvantage. It would tend to limit the activities of the school doctors, who, as a consequence, would lose contact with other aspects of industrial medicine. Dr. Peremans therefore suggests that medical supervision of industry in general should be reorganized on a larger scale.

The trade schools are already amenable to a certain amount of medical supervision, such as it is, and a number of sick apprentices have been detected. The last annual report mentions 2,813 cases of various disorders, among which scolioses and the sequels of rickets loom largest (686 cases), followed by debility and anemia (502 cases). Among male youths of all groups who submitted to medical examination, defects were present in about 10 per cent. The corresponding figure for industrial apprentices is more than 30 per cent. Among 28,199 young apprentices of both sexes, 8,725 defects were found on examination. Bad teeth and enlarged tonsils, to be sure, account for an extremely large proportion of the anomalies, but the commonness of these defects does not mean that they are to be neglected. Apart from 3,000 instances of defective teeth or tonsils, debility or anemia was present in 788 instances, defects of visual apparatus in 1,388 and defects of the osseous skeleton in 519. The results of these several investigations are disquieting. They verify the data furnished by army recruiting boards and the exceedingly inadequate services of school medical supervision. The younger generation is suffering, more profoundly than one unacquainted with the facts would believe possible, from the aftermath of four years of war and five years of economic depression.

The Future of the Profession in Belgium

The commission for study of the overcrowding of the universities and the unemployment of educated persons has published its second general report. In the entire kingdom in the year 1913 there were 4,426 physicians, or one physician to each 1,726 inhabitants; in 1930 there were 5,546 physicians, or one to each 1,459 inhabitants; in 1935 there were 6,311 physicians, or one to each 1,315 inhabitants. The increase has been greatest in Brabant; namely, from one doctor to 1,197 inhabitants in 1913 to one to 938 inhabitants in 1935. On the other hand, in Limbourg province, which has the fewest physicians, the number increased from ninety-three doctors in 1913 to 174 doctors in 1935, or from one doctor to 3,109 inhabitants in 1913 to one doctor to 2,285 inhabitants in 1935.

Overcrowding of the profession is essentially due to the large number of men who wish to practice in the urban areas. On Dec. 31, 1936, there were in Brussels and environs 1,379 physicians, or one physician to every 653 inhabitants; in Antwerp and environs 456 physicians, or one to every 1,068 inhabitants; in Liége and environs 416 physicians, or one to every 605 inhabitants, in Ghent and environs 242 physicians, or one to every 889 inhabitants.

The situation of the medical profession is not disquieting if one considers the development of social service, and a greater attention to hygiene on the part of the population as a whole. It is desirable, however, that there should be a better distribution of practitioners. It is particularly regretted that the number of colonial physicians should be inadequate and that so many newly graduated doctors forego this magnificent opportunity to bestow on the native population the benefits of hygiene and medical service.

Gasoline Poisoning in the Belgian Army Air Corps

Colonel Dr. Sillevaerts has published in *Bruxelles médical* a report on cases of poisoning attributable to combustibles, among the personnel of the Aéronautique militaire belge. Such accidents have been rare. There are no cases on record prior to the official adoption, on unexplained technical grounds, of "87 octane" type gasoline. In his discussion, the author takes up cases occurring among the ground personnel in charge of the fuel service and cases occurring during flight among the flying personnel, whether the result of absorption of gasoline before combustion or from inhalation of exhaust products from the motors of planes using the inculpated fuel. From his examination of all the data, Sillevaerts concludes that the handling of 87 octane tetraethyl gasolines in the presence of a circuit that is not hermetically closed will be followed by incipient intoxication, usually scarcely noticed, among the personnel of our gasoline depots. Minor disturbances observed (in one case a fairly severe poisoning developed) may be attributed in part to tetraethyl lead, in part to benzine poisoning. Disturbances noted during flight could be traced in part to back flow of vapors of unburned tetraethyl gasoline originating in leaks from faulty piping or from the functioning of the overflow pipes and in part to weak concentrations of carbon monoxide released in the atmosphere of the cabin. These disturbances usually appear only during aerial journeys that entail numerous and sudden changes of altitude as well as on the occasion of stunting; in other words, under circumstances which require the overflow pipes to function at full force and the engine to give off a maximum of carbon monoxide. All the tests were made on board planes that were in perfect flying condition and after the airtightness of the fire extinguishers and the soundness of the fuselage had been carefully determined.

Marriages

BERT TRUMAN BRUNDAGE, Nashville, Tenn., to Miss Mary Jo Page of McMinnville in Franklin, Ky., February 18.

DAVID SCOTT BAYER, New York, to Miss Birdella Virginia Murdock of New Haven, Conn., March 26.

PHILIP GROVER PADGETT, Bryson City, N. C., to Miss Charlene Cooper of Galveston, Texas, April 2.

WAYLAND NASH MCKENZIE, Albermarle, N. C., to Miss Alice Katherine Lacy of Richmond, in April.

DICKINSON SERGEANT PEPPER to Miss Hester Marie Laning, both of Philadelphia, April 23.

JOHN L. SCHILSKY, Springfield, Ill., to Miss Lois Stahr of Louisville, Ky., March 26.

JOHN DONALD FLYNN, Grand Rapids, Mich., to Miss Ruth E. Hess of Detroit, March 1.

JOHN WILLIAM STRAUGHAN, Warsaw, N. C., to Miss Helen Ann Ward, March 24.

HENRY BAGLEY BENSON to Miss Miriam Copeland, both of Atlanta, Ga., in April.

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Deaths

Calvin Hayes Elliott ✠ Hartford, Conn.; Medico-Chirurgical College of Philadelphia, 1905; member of the New England Obstetrical and Gynecological Society; fellow of the American College of Surgeons; visiting gynecologist and obstetrician to the Hartford Hospital; visiting gynecologist to the Municipal Hospital; consulting gynecologist and obstetrician to the Bristol Hospital, Bristol, Manchester (Conn.) Memorial Hospital, Rockville (Conn.) City Hospital, New Britain (Conn.) General Hospital and the Neuro-Psychiatric Institute of the Hartford Retreat; aged 59; died, March 15, in Tucson, Ariz., of abscessed teeth, secondary anemia and nephritis.

Haim I. Davis ✠ Chicago; University of Kharkov Faculty of Medicine, Kharkov, Russia, 1891; professor of psychiatry, emeritus, University of Illinois College of Medicine; member of the Central Neuropsychiatric Association; senior attending neurologist to the Michael Reese Hospital; chief of the attending staff and formerly superintendent of the Cook County Psychopathic Hospital; consulting neurologist to the Winfield (Ill.) Sanatorium; aged 72; died, April 11, of carcinoma of the lung.

William Harrison Leffler, Fountain Springs, Pa.; Medico-Chirurgical College of Philadelphia, 1907; served during the World War; for several years served on the staff of the Veterans Administration in Philadelphia, in Pittsburgh and in Newington, Conn.; aged 58; died, April 23, in the Veterans Administration Facility, Hines, Ill., of epithelioma of the bladder.

James Valentine Clarken, Baltimore; Baltimore Medical College, 1908; member of the Medical and Chirurgical Faculty of Maryland; at various times on the staffs of the Bon Secours, South Baltimore General, St. Agnes', Mercy and St. Joseph's hospitals and the Church Home and Infirmary; aged 51; died, April 17, of coronary thrombosis.

Robert Jackson Cabeen ✠ Leon, Kan.; University Medical College of Kansas City, Mo., 1903; past president of the Butler County Medical Society; part time county health officer for several years; member of the school board and mayor; aged 61; died, April 23, of cerebral hemorrhage, while playing golf at Glencoe, Ill.

Max Cohn, Chicago; Schlesische-Friedrich-Wilhelms-Universität Medizinische Fakultät, Breslau, Prussia, Germany, 1900; director of the department of radiology, Mount Sinai Hospital; aged 62; died, May 26, of suppurative pyonephrosis, diabetes mellitus, hypertrophy and abscess of the prostate.

Edmund B. Parsons ✠ Palestine, Texas; Tulane University of Louisiana Medical Department, New Orleans, 1885; fellow of the American College of Surgeons; on the staff of the Missouri Pacific Lines Hospital; aged 73; died, March 13, in a hospital at Houston of carcinoma of the sigmoid.

Herbert Morgan Decker, Davenport, Iowa; State University of Iowa College of Medicine, Iowa City, 1906; member of the Iowa State Medical Society; served during the World War; formerly a dentist; aged 60; died, April 21, in the Veterans Administration Facility, Minneapolis.

William Curtis Caywood, Winchester, Ky.; Kentucky School of Medicine, Louisville, 1906; member of the Kentucky State Medical Association; past president of the Clark County Medical Society; served during the World War; aged 60; died, April 13, of cerebral hemorrhage.

William Guy Pittman, Pine Bluff, Ark.; University of Louisville (Ky.) Medical Department, 1909; member of the Arkansas Medical Society; aged 56; died, March 16, in the Baptist Hospital, Memphis, Tenn., of chronic glomerular nephritis and malignant hypertension.

James L. Bolt, Easley, S. C.; Baltimore Medical College, 1895; member of the South Carolina Medical Association; past president and secretary of the Pickens County Medical Society; at one time member of the state legislature; aged 65; died, April 11, of coronary thrombosis.

George Herbert Mathewson, Montreal, Que., Canada; McGill University Faculty of Medicine, Montreal, 1894; formerly clinical professor of ophthalmology at his alma mater; for many years on the staff of the Montreal General Hospital; aged 68; died, March 18.

Robert James Kemper, Indianapolis; Indiana University School of Medicine, Indianapolis, 1908; member of the Indiana State Medical Association; aged 58; on the staffs of the Methodist Hospital, City Hospital and St. Vincent's Hospital, where he died, April 3.

William Wallace Russell, San Diego, Calif.; St. Louis University School of Medicine, 1916; member of the California Medical Association; served during the World War; aged 46; died, March 2, in the Mercy Hospital, of acute hemorrhagic nephritis.

Alban Judson Lobdell, Winchester, N. H.; New York Homeopathic Medical College and Hospital, 1893; member of the New Hampshire Medical Society; formerly member of the board of health; aged 69; died, March 5, in Keene, of pneumonia.

Henry Nicholas Harper, Ruston, La.; Tulane University of Louisiana Medical Department, New Orleans, 1904; parish coroner; on the staff of the Ruston-Lincoln Sanitarium; aged 58; died, April 3, of injuries received in an automobile accident.

Arthur L. Mikesell ✠ Fort Wayne, Ind.; Chicago Homeopathic Medical College, 1892; past president of the Allen County Medical Society; aged 70; on the staff of the Lutheran Hospital, where he died, April 8, of an acute gallbladder infection.

Owen Breckinridge Demaree, Frankfort, Ky.; University of Louisville Medical Department, 1891; served during the World War; aged 70; on the staff of the King's Daughters' Hospital, where he died, April 10, of bronchopneumonia.

Robert Lee James ✠ Blue Island, Ill.; Chicago Homeopathic Medical College, 1890; College of Physicians and Surgeons of Chicago, 1891; on the staff of St. Francis Hospital; aged 72; died, March 25, of sarcoma of the vertebra.

Merle Horton Whitlock, Washington, Ill.; Hahnemann Medical College and Hospital, Chicago, 1906; past president of the school board of Peoria; aged 55; died, March 29, in the Methodist Hospital, Peoria, of cerebral hemorrhage.

Robert Squair Noland, Nicholasville, Ky.; University of Louisville (Ky.) School of Medicine, 1937; intern at the Employees' Hospital of the Tennessee Coal, Iron and Railroad Company, Fairfield; aged 28; died, March 23.

Richard Herman Dingelstedt, Hoboken, N. J.; University of the City of New York Medical Department, 1895; aged 65; formerly on the staffs of St. Mary's Hospital and Christ Hospital, where he died, April 22, of heart disease.

Henry Pace ✠ Eureka Springs, Ark.; Washington University School of Medicine, St. Louis, 1903; past president of the Carroll County Medical Society; veteran of the Spanish-American War; aged 64; died, March 13.

James Francis Kelly, Hartford, Conn.; Yale University School of Medicine, New Haven, 1933; member of the Connecticut State Medical Society; aged 31; died, April 3, in St. Francis Hospital, of intracranial hemorrhage.

Richard Lionel King, Prince Albert, Sask., Canada; Trinity Medical College, Toronto, Ont., 1900; past president of the Council of the College of Physicians and Surgeons of Saskatchewan; aged 59; died, March 10.

Howard Armstrong Abraham, Oxford, N. Y.; University of Toronto Faculty of Medicine, 1906; on the staff of the New York State Woman's Relief Corps Home; aged 55; died, March 16, of heart disease.

Raymond Wesley Lagersen, Minneapolis; University of Minnesota Medical School, Minneapolis, 1923; on the staff of St. Barnabas Hospital; aged 40; died, March 13, in the University Hospital.

Frank Louis Sevanoak, Pittsfield, Mass.; College of Physicians and Surgeons, Medical Department of Columbia College, New York, 1883; aged 79; died, March 15, in the House of Mercy Hospital.

William A. Stillwagon, Kansas City, Kan.; College of Physicians and Surgeons, Medical Department Kansas City University, 1902; member of the Kansas Medical Society; aged 66; died, March 29.

Charles Lincoln Stoddard, San Diego, Calif.; Chicago Homeopathic Medical College, 1903; aged 75; died, March 15, in the Mercy Hospital, of acute dilatation of the heart following herniorrhaphy.

Henry Arthur Ulvin ✠ Milwaukee; University of Oregon Medical School, Portland, 1916; served during the World War; aged 48; died, March 31, of carbon monoxide poisoning, self administered.

Edward Monroe Jenkins, Hillsboro, Texas; Vanderbilt University School of Medicine, Nashville, Tenn., 1891; member of the State Medical Association of Texas; aged 69; died, March 27.

George Joseph Field ✠ Salt Lake City; Missouri Medical College, St. Louis, 1889; served during the World War; aged 70; died, April 23, at Rochester, Minn., of hypertrophy of the prostate.

John James Donohue, Uncasville, Conn.; Baltimore Medical College, 1909; member of the Connecticut State Medical Society; aged 80; died, April 17, of heart disease and paralysis agitans.

James Henry Moran, Chicago; Northwestern University Medical School, Chicago, 1909; on the visiting staff of St. Anne's Hospital; aged 66; died, March 2, of organic heart disease.

William O. Patton, Robbinsville, N. C.; College of Physicians and Surgeons, Baltimore, 1882; formerly member of the state legislature; aged 77; died, March 6, of cerebral hemorrhage.

Luther F. Rhodes, Abilene, Texas; Memphis (Tenn.) Hospital Medical College, 1898; formerly county health officer; aged 61; died, March 29, in Sanatorium, of pulmonary tuberculosis.

Jack Tipton Cottrell ✠ Catlettsburg, Ky.; University of Louisville School of Medicine, 1927; aged 38; died, April 1, in the Paintsville (Ky.) Hospital, of an accidental gunshot wound.

Charles Hill, Chicago; Northwestern University Medical School, Chicago, 1902; member of the Illinois State Medical Society; aged 75; died, April 11, of carcinoma of the throat.

William Carl Seale, Catchings, Miss.; Loyola University School of Medicine, Chicago, 1916; served during the World War; aged 45; died, March 30, in a hospital at Greenville.

Hermilo Mendoza, Juarez, Mexico; Universidad de Guadalajara Facultad de Medicina, Mexico, 1903; aged 63; died, April 25, following an operation for cholecystitis and nephritis.

Lewis Sydney Potter ✠ Detroit; Detroit College of Medicine, 1914; for many years on the staff of the Providence Hospital; aged 48; died, April 19, of carcinoma of the lung.

Charles Milton Storch, Biloxi, Miss.; University of Michigan Department of Medicine and Surgery, Ann Arbor, 1891; aged 67; died, March 14, of carcinoma of the prostate.

John Simon Windisch, Lakewood, Ohio; Western Reserve University Medical Department, Cleveland, 1894; also a dentist; veteran of the Spanish-American War; died, March 6.

Alphonsus J. Engel, St. Louis; St. Louis College of Physicians and Surgeons, 1899; aged 68; died, April 14, in the Missouri Baptist Hospital, of carcinoma of the pancreas.

Allan Chubb Steckle, Battle Ground, Wash.; College of Physicians and Surgeons of Chicago, School of Medicine of the University of Illinois, 1902; aged 65; died, March 5.

Joseph F. Campbell, Morristown, Tenn. (licensed in Tennessee in 1889); member of the Tennessee State Medical Association; aged 70; died, April 1, of pneumonia.

John Francis O'Brien, Canton, Ohio; Baltimore University School of Medicine, 1898; formerly on the staff of the Mercy Hospital; aged 63; died, March 7.

James Granville Mastin, Chicago; Keokuk (Ia.) Medical College, 1894; aged 80; died, March 3, in the Cook County Hospital, of arteriosclerotic heart disease.

Marie White, Pasrur, Punjab, India; Woman's Medical College of Baltimore, 1886; for many years a medical missionary; died, March 20, in Wilkinsburg, Pa.

Henry Elden Willdis, Cleveland; St. Louis University School of Medicine, 1937; intern at St. John's Hospital; aged 26; died, March 1, of bronchopneumonia.

William H. Byrd, El Dorado, Ark.; Memphis (Tenn.) Hospital Medical College, 1903; aged 79; died, April 3, of arthritis, heart disease and urinary suppression.

Ludovic Verner, Montreal, Canada; Laval University Medical Faculty, Montreal, 1902; Laval University Faculty of Medicine, Quebec, 1906; died in March.

Henry Howard Mather ✠ Chicago; Chicago Medical College, 1888; aged 77; died, March 11, of valvular heart disease, myocarditis and coronary occlusion.

Samuel M. Pitts, Saluda, S. C.; Medical College of the State of South Carolina, Charleston, 1886; aged 75; died, March 31, of coronary thrombosis.

L. R. Boynton, Mount Vernon, N. Y.; New York Homeopathic Medical College and Hospital, 1902; aged 68; died, March 10, of myocarditis and influenza.

Charles Clary Singley, Elmhurst, Ill.; Jefferson Medical College of Philadelphia, 1881; aged 81; died, March 17, in the Elmhurst Community Hospital.

Martin W. Dawley, Richfield Springs, N. Y.; Eclectic Medical Institute, Cincinnati, 1886; aged 77; died, March 23, of arteriosclerotic heart disease.

Sara Day Hosford Lewark ✠ Strasburg, Colo.; Colorado School of Medicine, Boulder, 1897; aged 65; died, April 8, in the Mercy Hospital, Denver.

Gordon Elliot Booth, Ottawa, Ont., Canada; McGill University Faculty of Medicine, Montreal, 1910; aged 53; died, March 6, of heart disease.

James C. Clarke, Baltimore; Hahnemann Medical College and Hospital of Philadelphia, 1888; aged 72; died, April 15, of carcinoma of the larynx.

John Jackson Farmer, Rome, Ga.; Georgia College of Eclectic Medicine and Surgery, Atlanta, 1909; aged 76; died, March 22, of carcinoma.

Charles C. Echols, Canon, Ga.; University of Georgia Medical Department, Augusta, 1900; aged 67; died in April, of cerebral hemorrhage.

Clarence Moors Golden ✠ Tyler, Minn.; St. Louis College of Physicians and Surgeons, 1906; aged 60; died, March 23, of cirrhosis of the liver.

Charles Fisher Howell, De Quincy, La.; Tulane University of Louisiana Medical Department, New Orleans, 1901; aged 66; died, March 21.

Allan James MacKinnon, Zurich, Ont., Canada; University of Toronto Faculty of Medicine, Toronto, Ont., 1908; aged 63; died, March 18.

Roy Ross Risk, Anna, Ill.; Rush Medical College, Chicago, 1930; served during the World War; aged 45; died, March 21, of angina pectoris.

Charles Murray Clayton, Indianapolis; Medical College of Indiana, Indianapolis, 1902; aged 61; died, April 1, in the Methodist Hospital.

Edward Dickson, Coal Creek, Tenn.; Medical College of Alabama, Mobile, 1882; aged 83; died, April 10, of cerebral hemorrhage.

William K. Richardson, Tompkinsville, Ky.; University of Nashville (Tenn.) Medical Department, 1877; aged 88; died, March 10.

James Lorne Graham, Ottawa, Ont., Canada; University of Toronto Faculty of Medicine, Toronto, 1909; aged 50; died, March 12.

Emily Brooke Slosson ✠ Sabetha, Kan.; Woman's Medical College of Pennsylvania, Philadelphia, 1875; aged 86; died, March 15.

Joseph Aloysius Corcoran, Montreal, Que., Canada; Trinity Medical College, Toronto, Ont., Canada, 1898; aged 59; died, March 13.

Benjamin H. Brock, Hogansville, Ga.; Southern Medical College, Atlanta, 1894; aged 70; died, April 1, of carcinoma of the liver.

Joseph L. Lalonde, Pawtucket, R. I.; School of Medicine and Surgery of Montreal, Que., Canada, 1900; died, April 6.

Roscoe Broughton ✠ Laurel, Mont.; Detroit College of Medicine, 1904; mayor; aged 55; died, April 9, of heart disease.

John Michael Crowley, Franklin, Mass.; Dartmouth Medical School, Hanover, N. H., 1897; aged 62; died, March 31.

John L. Homer, Minneapolis; University of Oklahoma School of Medicine, Oklahoma City, 1935; aged 28; died, April 8.

Duncan McEwen, Maxville, Ont., Canada; McGill University Faculty of Medicine, Montreal, 1896; died, March 23.

Robert Martin Coleman, Wellesley, Mass.; Tufts College Medical School, Boston, 1921; aged 44; died, March 24.

Leslie B. Sorrell, Waldron, Ark.; Eclectic Medical University, Kansas City, Mo., 1914; aged 50; died, March 11.

Alfred Thomas Little, Barrie, Ont., Canada; Trinity Medical College, Toronto, 1885; aged 75; died, March 29.

Gustave Charles Wichman, Glendale, Calif.; Illinois Medical College, Chicago, 1899; aged 63; died, March 28.

Eugene Merchants Brown, Boston (licensed in Massachusetts by years of practice); aged 68; died, March 28.

George B. Sharp, Piedmont, Ala.; Southern Medical College, Atlanta, 1893; aged 67; died, March 21.

R. H. Mays, Duke, Okla.; Ensworth Medical College, St. Joseph, Mo., 1906; aged 58; died, March 19.

Edward L. Webb, Los Angeles; Rush Medical College, Chicago, 1894; aged 65; died, March 10.

Samuel M. Dow, Cleveland (licensed in Ohio in 1896); aged 84; died, April 13, of pneumonia.

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Correspondence

INJECTION METHOD FOR HERNIA

To the Editor:—Recent issues of the medical press have carried notices that the U. S. Employees Compensation Commission has issued an order dated Feb. 24, 1938, that the treatment of hernia by the injection method is not authorized and will not be paid for in WPA and federal employee cases. This, of course, will be taken as official government condemnation of a mode of treatment, in itself a dubious assumption of authority in matters of medical opinion, which, if followed as a precedent, is likely to hamper progress on more than this one medical front.

What is worse, this order merely makes official an attitude stubbornly held by this commission over several years, as numerous herniated federal employees know to their cost. The argument used to be that federal employees can be operated on in Navy and Army hospitals at low cost to the government, this single consideration of economy being brought forward as sufficient and decisive. All efforts to bring before the commission the favorable results now widely being secured by competent and experienced workers with the injection method have always been met by curt, ex cathedra citation of official "decisions." That several thorough modern studies and reports on an aggregate of more than 5,000 carefully traced cases today show (with one questionable exception) injection results fully comparable to those of surgery is being consistently ignored. Official opinions and decrees, it seems, are not subject to review and reconsideration.

This arbitrary attitude on the part of the compensation authorities has worked real hardship on federal employees. I can cite nineteen cases (in which there were twenty-four hernias) which have come locally under my personal care, mostly from one federal establishment. Every effort to secure federal compensation having been flatly rejected if the injection treatment was employed, these employees of the government have stayed on the job, taken this ambulatory treatment and paid for it out of their own pockets. Of the nineteen, two cases are still under treatment, all the others being cured. This group has sent a total of thirty-four patients who have taken this treatment, with a number of others who are considering it on the recommendation of members of the group. In some instances the securing of federal jobs or the getting of promotions has depended on the curing of these hernias. In every such instance the case was passed on as cured after the injection treatment, and the job or promotion secured. In other words, despite the condemnation by the compensation officialdom and their refusal to pay for the injection treatment even if effective, federal employees, on the basis of results experienced by their fellows, are choosing the injection treatment, paying for it themselves, getting cured and being pronounced cured by federal medical examiners. Whereupon prejudice, in position of authority, extends its arbitrary decision to a vast army of relief workers as well as to regular federal employees, thereby, I presume, contributing to the progress in the Works Progress Administration.

Far more enlightened and considerate is the attitude expressed in a letter just arrived from a private concern, a self insurer under the New York compensation law. It refers one of its employees for hernia treatment by the injection method and states that, though it is not responsible in this case under the compensation law, it is lending the employee the money for the treatment. But, then, this concern has had actual experience with this treatment in numerous cases over a period of years, and, besides, it has no "authority" to exercise or maintain. In this respect, at least, federal employees and relief workers are less fortunate in the fairness and intelligence of their boss.

S. W. FOWLER, M.D., New York.

TESTS FOR ALCOHOLIC INTOXICATION

To the Editor:—Referring to the letter on this subject in THE JOURNAL, April 23, page 1386, it is to be questioned whether Dr. Reinke has given indication of experience that justifies him in deprecating laboratory methods of determining intoxication.

Dr. Reinke's first point was that the personal equation of various drinkers was not sufficiently considered. He believes that the alcoholic brain concentration lethal for an infant would not have nearly so deleterious an effect on a drunkard. What has such a surmise to do with alcoholic drivers? The articles Dr. Reinke refers to did show, at least, that there are among "adults" definite levels of concentration of alcohol beyond which a state of intoxication or actual drunkenness is present. Reference was made in one of the articles to the fact that these levels were the same whether found in habitués or in occasional drinkers, since increased toleration is due to increased oxidation of the alcohol and to other less important factors which combine to rid the system of alcohol faster as toleration increases.

When the charge against a driver is such that the question of his degree of intoxication becomes important, and if any specimen, taken from him with his consent, is found to show an unquestioned state of drunkenness and testimony is so offered at trial, the defense will secure testimony from those who clinically observed the defendant at the time the specimen was taken. This testimony will of course be that they (lay witnesses or otherwise) believe the defendant to have been then drunk. The scientifically obtained testimony may then be thrown out on the ground that a drunken person cannot give valid consent (to the taking of the specimen from him). Afterward defense testimony will all too often lead to acquittal of the prisoner. However much such a state of affairs indicates needed changes of law, it has nothing to do with the science and justice of the tests in question.

ROBERT C. KEYS, M.D., Fairfield, Conn.

THE PROTECTIVE ACTION OF CERTAIN SULFANILAMIDE DERIVATIVES IN EXPERIMENTAL INFLUENZA INFECTIONS

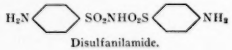
To the Editor:—The recent report before the American Chemical Society meeting of the details of synthesis of a series of sulfanilamide derivatives by Crossley, Northey and Hultquist (Sulfanilamide Derivatives: I. Amino-Aryl-Sulfonamido-Aryl-Sulfonic Acids and Amino-Aryl-Sulfonamino-Aryl-Carboxylic Acids; II. Disulfanilamide and Related Compounds; III. Strepto-*N*-Polysulfanilyl-Sulfanilamides and Related Compounds, *J. Am. Chem. A.*, to be published) together with the statement that they have been found to be effective protective agents in experimental infections with influenza virus makes us feel that some of the preliminary experimental work on which these statements are based should be presented to the members of the medical profession for critical analysis.

A series of almost 100 sulfanilamide derivatives have been subjected to preliminary examination for protective action in experimental influenza virus infections. The Puerto Rico strain of human influenza virus, originally obtained from Dr. Francis of the Rockefeller Institute for Medical Research, was employed throughout the entire series. The procedure for the intranasal administration of the virus to mice has been described in detail by Francis and only the essential principles are given here. Lungs from infected mice are removed aseptically and ground up with sterile sand and saline solution. The final suspension is approximately 1:1,000; this is centrifuged and from 0.01 to 0.02 cc. administered intranasally to mice previously anesthetized with ether. Care is taken to see that all the material so administered is aspirated. The mice are of the Swiss strain, are from 4 to 6 weeks of age and weigh from 10 to 14 Gm.

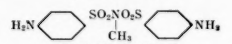
Control animals so infected begin to show symptoms from the second to the seventh day following administration. The duration of the incubation period bears an inverse relationship to the quantity and virulence of the virus administered. The acute symptoms are roughened coat, apathy, evidence of fever and marked dyspnea. Death occurs from ten to seventy-two hours after the onset of acute symptoms and the most characteristic lesion post mortem is massive consolidation of both lungs. Animals do not recover after showing acute symptoms.

The first two substances examined in this series were sodium sulfanilyl-sulfanilate, which had previously been described by A. R. Dochez and C. A. Slanetz (The Treatment of Canine Distemper with a Chemotherapeutic Agent, Sodium Sulfanilyl-Sulfanilate, *Science* **87**:142 [Feb. 11] 1938) to be an effective chemotherapeutic agent in the protection of animals experimentally infected with dog distemper virus, and of sulfanilamide itself, which had been described by S. M. Rosenthal, J. G. Wooley and Hugo Bauer (The Chemotherapy of Choriomeningitis Virus Infection in Mice with Sulfonamide Compounds, *Pub. Health Rep.* **52**:1211 [Sept. 3] 1937) to be effective in treating experimental choriomeningitis of mice. Neither of these substances had any effect on the course of experimental influenza infections.

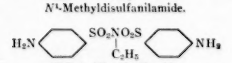
Up to the present time two types of substance have been found capable of influencing the course and eventual outcome of the experimental disease. The first is disulfanilamide and is represented by three members: disulfanilamide, N^1-methyldisulfanilamide, and N^1-ethyldisulfanilamide, having the structural formulas:



Disulfanilamide.

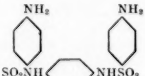


N^1-Methyldisulfanilamide.



N^1-Ethyldisulfanilamide.

The second type substance is represented by 2,5-bissulfanilamidobenzene-sulfonic acid, with the structural formula:



This experimental procedure was followed throughout the entire series: mice were divided into groups of tens, and after infection treated according to the following scheme:

Group A. Untreated controls.

Group B. Ten mg. of drug (subcutaneously) at one, twenty-four, forty-eight and seventy-two hours after infection.

Group C. Ten mg. of drug (subcutaneously) at twenty-four, forty-eight and seventy-two hours after infection.

Group D. Ten mg. of drug (subcutaneously) at forty-eight and seventy-two hours after infection.

Group E. Ten mg. of drug (subcutaneously) at seventy-two hours after infection.

It was found that all the drugs described in this paper were capable of protecting infected animals provided a moderate infecting dose of the virus was administered; that is, when the infecting dose was of such an order as to produce acute symptoms after an incubation period of at least four days. When the infecting dose was increased to the point at which the control groups showed acute symptoms by the second or third day after infection, with the majority of deaths on the third or fourth day, the drugs were completely ineffective. This is illustrated in the accompanying protocols. The key letters of the groups are the same as those already described. Disulfanilamide was employed in both of these experiments. In the first instance a moderate infecting dose was administered, while in the second series a much stronger infecting dose was administered.

SERIES 1.—*Moderate Infecting Dose*

	Percentage Mortality on				
Group	3d Day	6th Day	9th Day	12th Day	15th Day
A	0	80	100	10	10
B	0	0	0	0	0
C	0	0	10	10	10
D	0	20	30	30	30
E	0	30	50	70	70

SERIES 2.—*Strong Infecting Dose*

	Percentage Mortality on				
Group	3d Day	6th Day	9th Day	12th Day	15th Day
A	90	100	10	...	...
B	80	90	100	...	...
C	90	100	10	...	...
D	100	100	10	...	...
E	90	100	10	...	...

The differences in activity of the substances described here are small. The protocols which are given for disulfanilamide are almost identical with those for the other substances and will be published in detail in the near future.

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M. L. CROSSLEY, PH.D.
E. H. NORTHEY, PH.D.
Calco Chemical Company Research Laboratory.

Queries and Minor Notes

THE ANSWERS HERE PUBLISHED HAVE BEEN PREPARED BY COMPETENT AUTHORITIES. THEY DO NOT, HOWEVER, REPRESENT THE OPINIONS OF ANY OFFICIAL BODIES UNLESS SPECIFICALLY STATED IN THE REPLY. ANONYMOUS COMMUNICATIONS AND QUERIES ON POSTAL CARDS WILL NOT BE NOTICED. EVERY LETTER MUST CONTAIN THE WRITER'S NAME AND ADDRESS, BUT THESE WILL BE OMITTED ON REQUEST.

REMOVAL OF TATTOO MARKS

To the Editor:—Please advise me as to the methods of removing tattoo marks.

LEON A. FRANKEL, M.D., Philadelphia.

ANSWER.—Tattoo marks are of two kinds, intentional, supposedly decorative, and accidental, from powder explosions, falling in cinders and similar accidents. In all of them the pigment is deposited in the corium, deeper in the accidental than in the intentional cases, and therefore more difficult to remove. Many different processes have been used:

1. Rubbing the skin is said to remove tattoo marks when it is done persistently. Janson (Eine einfache Methode der Entfernung von Tätowierungen, *Dermat. Wchnschr.* **101**:894 [July 20] 1935) anesthetizes with procaine and epinephrine and then rubs the skin of the mark with a stiff brush until it bleeds. He then applies an ointment of 2 per cent anesthesin in zinc oxide ointment. The treatment must be repeated a number of times. On the skin of the trunk or arm it is satisfactory but not on the hand or fingers. G. H. Klövekorn (*ibid.* **101**:1271 [Oct. 12] 1935) substantiates Janson's assertions.

2. Fahlbusch and Holtz (Eine neue Methode zur Entfernung von Tätowierungen, *München. med. Wchnschr.* **83**:1598 [Sept. 25] 1936) use live steam from an inhalation kettle carried by a rubber tube with a glass nozzle to the area to be treated. The skin is cleansed with ether and alcohol, then anesthetized with procaine and epinephrine, and the borders of the area protected with zinc paste, a proper margin being allowed beyond the visible border of the mark. After the steam has been applied for a few seconds, the epiderm can be rubbed off, exposing the cutis and the pigment particles. The steam is kept on this until it turns white; then a burn liniment is applied and internal sedatives are given to alleviate the pain after the effect of the

local anesthetic has worn off. After twenty-four hours the wound is dressed with a bland ointment, and in from two to six days the pigment may be brushed off or picked out of the wound with little pain. The patient can return to work after three days. The scar is thin and soft. No infection occurs if ordinary surgical care is used, for the steam disinfects the wound.

3. Thurn (Narbenlose Entfernung von Tätauierungen, *Med. Klin.* **33**:1134 [Aug. 20] 1937) advocates the use of salicylic collodion applied until the area oozes, then pressing in fine salt crystals. This causes sharp pain for from twenty to thirty seconds. Local anesthesia may be necessary. Dry dressings are applied, which, with the crust, must be removed on the third day, bringing with it the pigment. The epithelium is restored in from six to eight days. One treatment is usually enough, but repetition is sometimes necessary.

Others use pyrogallic plaster, carbon dioxide snow, digestives, ultraviolet rays or tattoo in a skin colored enamel to cover the marks. Karpelis, who seems to have had experience, disapproves of these methods (Ueber Entfernung von Tätauierungen, *München. med. Wchnschr.* **84**:529 [April 2] 1937) and the use of electrolysis but favors surgical excision for small marks and the galvanocautery for the larger ones. With this he shells off the epidermis and then attacks the pigment, which thus has become visible. He is careful to treat 1 or 2 mm. beyond the border of the mark to ensure getting it all. The cold cautery he values much less. He also favors the method of cross hatching the skin fairly deeply with a scalpel, stoppage of bleeding and then rubbing in finely pulverized potassium permanganate. A dry dressing is then applied.

The most popular method of all and one that is still approved by experts is that of Variot. A 50 per cent solution of tannic acid is tattooed into the mark just deep enough to avoid any considerable bleeding. Then the silver nitrate pencil is rubbed over this area until it becomes black. The black crust separates in about sixteen days. If the mark is an accidental one and particles of carbon remain, the crust should be removed earlier and the remaining particles of pigment curetted out. M. D. Shie (A Study of Tattooing and Methods of Its Removal, THE JOURNAL, Jan. 14, 1928, p. 94) recommends anesthesia with procaine and epinephrine when the mark is on the face or ears to control bleeding, which interferes with the penetration of the tannic acid solution. The pain is so slight when the tattooing is done rapidly that it is inconsequential.

For discrete carbon particles, H. C. L. Lindsay (Surgical Removal of Powder Tattoo, THE JOURNAL, Nov. 6, 1937, p. 1530) recommends excision of each blue point with a cataract knife. Suturing is seldom necessary if the operator is careful to make small wounds. Another surgical method is to loosen a flap containing the whole tattoo mark, turn it over and pick out the pigment, then right it and suture it in place.

Like many other procedures for which many methods are used, the best results are obtained by becoming expert in a few of the methods and choosing carefully the one best suited to the case in hand.

VISCEROPTOSIS

To the Editor:—A woman, aged 30, shows roentgenographic evidence of colon and stomach ptosis. She has constipation and dragging pain in the umbilicus. Will a surgical belt or support of any kind aid the patient?

ROBERT D. KANE, M.D., Elmhurst, N. Y.

ANSWER.—The treatment of gastro-enteroptosis is best outlined by consideration of the various types that occur. A. P. Cawadias has mentioned three: 1. The well known Stiller syndrome, which is constitutional and is synonymous with an asthenic constitution and a microsplanchnic hypovegetative constitution (Pende). These individuals have a long narrow thorax, there is a general scarcity of fat, and x-ray examination shows a general enteroptosis including elongation of the stomach, colon and kidneys. Psychologically these patients tend to be introverts. 2. The neurotic type, in which the symptom complex comprises headaches, insomnia, depression and a general anxiety about their condition. These patients are prone to believe that they have a serious abdominal disease and to restrict their diet, thus creating a vicious circle, the resulting loss of weight further increasing the visceroptosis. 3. Rarely, gastro-enteroptosis characterized by pain which is not relieved by the horizontal position. This is due to perivisceritis and follows some primary inflammation. The treatment depends on attacking the underlying cause.

Goldthwait has shown that in many individuals there is a definite sagging of the diaphragm and lower ribs. Improvement in these patients, he says, can be obtained only by the use of corrective exercise. In connection with the remodeling of the body, jackets are often of help. These should include some definite support to the back. Belts and supports are of relatively little value unless accompanied by other forms of treatment. Diet is of vast importance and when a good increase in weight can be obtained the results are almost invariably good. Exercise, both in the lying and in the erect position, is an essential part of therapy. The use of belts should be considered as only an accessory in the treatment. Psychotherapy may accomplish more than any other one measure in the neurotic type. It should be remembered that there are a great many patients with extreme visceroptosis who are symptom free and it is a mistake to emphasize low-lying organs found accidentally or incidentally by x-ray examination.

TINNITUS AURIUM

To the Editor:—A woman, aged 55, complains bitterly of a roaring and buzzing noise in the head which makes her feel as if the whole body were throbbing and affects her sleep. She thinks the condition is affected by taking salt or sugar. She has had this trouble for five years. The menopause began in June 1930 and was complete by February 1934. With the terrific roaring in the head she is exceedingly nervous and often has insomnia. The nurse can tell from her appearance when an attack is about to come. A severe attack lasts several days but she is rarely free from all the noise. Sometimes with it there is twitching of the face muscles of mild degree. The roaring has increased during the last three years. With an attack the pulse rate goes from 74-80 to 100-110 and she becomes alarmed. Sometimes it awakens her from a sound sleep. She has been treated since 1927 for pulmonary tuberculosis, which is but slightly active today. In 1931 she had at one time a blood pressure as high as 200/110 and the same year it fell to 130/80, which is approximately the pressure she has maintained since then. I have tried theelin, emmenin, a low salt diet and ergotamin without benefit. There have been several phases of "nervous breakdown" during these ten years. The urine is normal. Inflation of the eustachian tube for a mild catarrhal condition led to no benefit. Suggestions for treatment would be appreciated.

M.D., New York.

ANSWER.—Most cases of tinnitus are subjective in character. There are, however, unusual occasions in which the noise may be demonstrated to an observer. Head noises may arise from conditions within the ear and in the immediate neighborhood of the ear. In practice the most persistent and annoying forms of tinnitus are usually seen in connection with disease of the internal ear and its central pathways. Tinnitus due to conditions within the external auditory canal and the middle ear are apt to be much less annoying and much more amenable to treatment. In the neighborhood of the ear transmitted noises from arteries, veins or aneurysms are occasionally observed. The use of drugs such as acetylsalicylic acid may produce tinnitus without apparently any permanent or demonstrable effect on the hearing.

The description of the sounds varies from low, rushing, murmuring sounds usually assigned to disease in the middle ear to high pitched, hissing, whistling, ringing noises generally thought to be due to difficulties in the internal ear. From this type of head noise to a type characterized by distinct musical character is only a short step. Such noises may be designed as whistling, ringing, bell-like in character. One step further carries one into the realm of noises that begin to partake of hallucinations. A patient will say that an old melody recurs over and over again; perhaps some song not heard since early childhood. The last step is, of course, distinctly hallucinatory in character. Voices and other sounds are heard and associated with mental disturbances of a profound character.

Again it is not easy to say how much the so-called nervous constitution has to do with these noises. Certainly, a persistent tinnitus may make the most self-contained person nervous and, on the other hand, it should not surprise any one that the highly strung person would be apt to exaggerate the distress he experiences.

It is therefore plain that the patient's description of the noises and the degree of reaction to them must in some measure be related to the nature and location of the disease area as well as be influenced by the temperament of the sick person. The patient is of a nervous character. Her complaint, with its intermissions, is such that it could be due to some disturbance in the end organ of hearing and its central pathways. She also has had a hypertension and, while the blood pressure is lower now than it was, there still may be changes of a vascular character in the brain sufficient to produce the symptoms. There is no statement made as to the absence or presence of a hearing defect. The presence of a hearing defect, especially a severe one, might help to locate the lesion in the cochlea. It is just such deafness of an auditory nerve type that produces tinnitus of the more severe and persistent kind. From time to time also tinnitus of a stubborn and troublesome character may precede by many years the onset of such a deafness.

Experience states that treatment of the type of tinnitus described is apt to be without benefit. Psychotherapy, encour-

agement of the patient to accept her condition with as much philosophy as possible, and the avoidance of fatigue and nervous strain as well as the use of mild sedatives are all indicated. As much as possible one should attempt to discover the cause and by so doing influence for the better this most aggravating complaint.

POSSIBLE ANOREXIA NERVOSA

To the Editor:—A woman, aged 34, an executive in a college, has a usual weight of from 130 to 140 pounds (59 to 63.5 Kg.); her highest weight was 160 pounds (72.6 Kg.) in 1927. Her menses began at 16 and occurred from two to four times a year until 1933, lasting four to five days. In 1932 she began to lose weight, the greatest loss occurring from December 1934 to March 1936, at which time it reached 86 pounds (39 Kg.). Constipation has always been severe. Cathartics have been taken in large amounts and many stools daily resulted. Epigastric distress and flatulence prevented the usual diet and from 1934 to 1936 it was limited to fruits and vegetables. In 1932, swelling of the face, thighs and legs, without pitting, developed. She felt heat excessively and could not stand a warm room. There was palpitation on exertion. When in March 1936 her weight reached 86, she was studied in a hospital. There was no fever. The blood pressure was 100 systolic, 60 diastolic. General examination was negative except for wrinkling of the skin of the legs, as if from edema. Laboratory work failed to reveal any evidence of organic disease. The urine was normal, the blood urea nitrogen 7, total blood protein 5.8, albumin 4.2, globulin 1.5, metabolic rate minus 20, cholesterol 289, red blood cells 4.7 million, hemoglobin 100 per cent and white blood cells 15,700. Five days later after she had gained 10 pounds (4.5 Kg.) the red blood cell count was 4.0 million, hemoglobin 80 per cent, white blood cells 9,300. A chest roentgenogram was negative. The skull roentgenogram showed a normal sella turcica, and the optic fields and the fundi were normal. The stools were normal and x-ray examination of the gastro-intestinal tract gave negative results. The diagnosis lay between malnutrition from dietary restriction and Simmonds' syndrome. Accordingly the patient was given a 3,500 calory diet with added vitamins and 4,000 cc. of fluids. Within two months her weight had risen to 130 pounds (59 Kg.), which was held to April 1937. Her complaints were not relieved, however, as she continued to feel heat and itching in her face and tightness of the thighs, although no swelling was evident, and the stools were loose, whether frequent or infrequent. No menstruation had occurred since 1933. It was thought advisable to try endocrine therapy, and injections of the gonadotropic factor from the urine of pregnancy and anterior pituitary extract were given, a total of 40 cc. in 1937. Menstruation occurred three times, in May, June and July. She improved subjectively during the spring and summer, but in the fall began to feel bad generally, did not feel like eating, tired easily, and acquired edema of the face and extremities. The output of urine was low, a pint or less daily. Ammonium chloride from 60 to 90 grains (4 to 6 Gm.) daily caused some increase in output with improvement in symptoms, but its effect seemed to wear off and salyrgan was used a few times at weekly intervals with benefit. The urine was normal, as was the general examination. The bowels were moving five times daily with cathartics, and there was a good deal of flatulence. She was unable to do without cathartics. Enemas were without effect. Her weight now (December 1937) is 117 pounds (53 Kg.). What diagnostic possibilities are there? What further studies should be made to clarify the diagnosis? What therapy is indicated? Should she be put to bed with high calory feeding as was done in 1936, thereby sacrificing her position? Should endocrine therapy be continued, possibly in greater amounts? Thyroid extract was first used in 1934. She was intolerant to even one-tenth grain (0.0065 Gm.) three times a day.

M.D., New Jersey.

ANSWER.—The clinical syndrome described appears to be due to dietary restriction or, if one prefers the term, "anorexia nervosa." Simmonds' disease, which depends on actual destruction of the anterior lobe of the hypophysis, for all practical purposes, is excluded from consideration by the long history associated with the case and by the absence of any objective evidence of hypophysial involvement. Anorexia nervosa, while usually regarded as a functional disorder, manifests itself at times in a manner suggestive of a physiologic disturbance of the anterior lobe of the hypophysis, with subsequent failure to provide thyrotropic and gonadotropic substances in normal amounts. The multiplicity of bizarre symptoms mentioned by this patient is not unusual in cases of anorexia nervosa and appears to depend on the existence of an unstable nervous constitution.

Further diagnostic studies might include repeated determinations of the basal metabolic rate and of the concentration of cholesterol of the blood as well as examination of the deep reflexes. The history of edema is somewhat suggestive of the presence of atypical or mild myxedema. If an actual deficiency of the thyroid gland is present, some sluggishness of the reflexes may be demonstrated (Chaney, W. C.: Tendon Reflexes in Myxedema, THE JOURNAL, June 21, 1924, p. 2013). It may be noted parenthetically that edema of dependent parts is sometimes encountered in cases of anorexia nervosa for reasons that are not entirely clear; possible qualitative alterations of the proteins of the plasma and reduction in the colloidal osmotic pressure of the serum have been suggested as explanations. The presence of irritability of the bowel suggests two possibilities for investigation: search for parasites in the stool and examination of the gastric juice, for anacidity is commonly encountered in cases of anorexia nervosa. If the stools contain more than the normal amount of fat the possibility of the presence of pancreatic disease must be considered; in particular, studies of the enzymatic activity of the contents of the duodenum should help to determine this.

Assuming that all organic disturbances can be eliminated from consideration and that the diagnosis of anorexia nervosa can be established, treatment is most difficult. The best results, as a rule, are obtained by prolonged rest in bed, by psychotherapy, by forced feeding and by elevation of the basal metabolic rate. Use of thyroid extract should be persisted in even if mild signs of intolerance are noted when its administration is begun and an attempt should be made to maintain the basal metabolic rate at a level of about —5 per cent. Use of insulin to increase appetite and food intake is helpful in certain instances. Avoidance of laxatives, assurance of an adequate intake of food and an ample supply of vitamins or of protein and of bulky foods should contribute to increase in weight and strength and to amelioration of the constipation and irritability of the bowel. The menstrual cycle often is restored by this treatment alone and, as a rule, it is well to forego the use of such preparations as gonadotropic substance and extract of the anterior lobe of the pituitary gland until the basal metabolic rate and the body are restored to normal. Relapses are to be expected and their occurrence does not imply necessarily that either diagnostic or therapeutic errors have been made.

DANGERS OF PARAFFIN

To the Editor:—What are the dangers and uses of paraffin? The paraffin is melted and put through a mechanical spray under two pounds of pressure, which causes the paraffin to leave the machine in a powder form. The room measures approximately 20 by 18 feet and is ventilated by a suction fan. The worker is supplied with a small mask with a cloth ventilator but states that this mask is unsatisfactory in use. Isn't it true that there is considerable danger in breathing the air in a room where paraffin is mixed with the air? What type of mask would be most satisfactory to use for this work?

M.D., West Virginia.

ANSWER.—Pure paraffin wax is widely regarded as nontoxic, but possibly it may possess some carcinogenic properties. The misuse of paraffin in cosmetic surgery has been associated with paraffinomas. Work around molten paraffin, particularly if the paraffin is overheated, is more uncomfortable and nauseating than dangerous and is important because of associated distaste for food and possible resulting malnutrition. R. Prosser White (The Dermatergoses or Occupational Affections of the Skin, London, H. K. Lewis & Co., 1934) has reported that in a group of women and girls long employed under conditions in which they were literally bedaubed with paraffin wax during their work, none experienced the least inconvenience or distress, either internally or externally. Bridge, whom White cites, has found no evidence of skin disorder among paraffin candle makers. Liquid petrolatum or wax taken internally or applied to the skin rarely has proved detrimental, although the use of liquid petrolatum in constipation has been associated with eczema ani; but here mechanical abrading may constitute a factor (Gibson, Robert: Risk of Liquid Paraffin in Chronic Constipations, *Brit. M. J.* **1**:876 [May 14] 1927).

In industry, paraffin oils and closely related petroleum derivatives have been associated with industrial dermatoses, acne, furunculosis and possibly tar cancer. However, it seems possible to demarcate for toxicologic purposes pure, solid paraffin and at least some of the paraffin oils.

In the printing industry the paraffin spray is sometimes used as a rapid drier for ink. It has been reported that paraffin dust or flakes ball up in the respiratory passages and may be coughed up or blown out of the upper respiratory areas. The best solution to this problem is to be found in a local exhaust system rather than in general room ventilation. A suitable small appliance may be designed to entrap all the extraneous paraffin dust. The wearing of ordinary masks or respirators is not entirely satisfactory, since the waxy nature of the paraffin tends to seal off the filtrating surface of the mask to an extent greater than ordinary dust. Thus breathing is hampered and workers may decline to wear a mask of the type that actually serves as a filtering medium. It may prove desirable to provide the worker or workers with a light type of positive pressure respirator, which continually furnishes respirable air from a suitable source remote to the contaminated workroom atmosphere. Many types of respirators are available through commercial sources, some of which are recognized as suitable by the United States Public Health Service or by the Bureau of Mines.

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MAKING OF FOOTPRINTS

To the Editor:—To obtain footprints, the old fashioned method is still mostly used, of having the patient stain his sole on an ink pad and step on a paper. This method gives a good picture but has the disadvantage of soiling the foot with ink and, therefore, it cannot be used in cases of ulcers or sore spots. When I saw the method of fingerprinting used in the postoffice (put the finger on a glass plate covered with some fat or paraffin and then on a piece of paper which is afterward stained with a developing fluid, resulting in a nice picture without marring the patient's skin) I thought that this method could also be used for footprinting. On the suggestion of the postmaster I wrote to the Postmaster General's Department in Washington for the formula of the developer and also the kind of fat used but received the answer that it is not permissible to render such information. When I wrote to the Bureau of Investigation in Washington, Mr. Hoover answered that he could not give me the formula but that I should communicate with the Faurot Indentification System in New York. This company, however, did not give me the formula, which, it said, is antiquated, but recommended its own product. On further investigation I found that a German manufacturer of chemical products, I. G. Farbenindustrie A. G., sells a developer for this purpose; its formula also is secret. For the sake of completeness Freiberg's method has to be mentioned of staining the foot with a solution of tannic acid and then the paper with ferric chloride; the compound is ink, and a black but not clear picture is obtained. Now I am wondering whether you would be able to find the formula of the developer for printing, with the method of staining with petrolatum or fat. I think that not in medical literature, but in criminalistic books on dactyloscopy more information can be found. I am not in a hurry to get this information, so please take your time.

M.D., Illinois.

ANSWER.—There appears to be no publication which gives information on the newer methods of taking fingerprints and footprints. On the whole, the ink method has been the most satisfactory. Chemical formulas are used by a number of police departments; our correspondent believes that a formula may be found that will leave an imprint where there is the greatest pressure. Certain parts of the foot may produce a greater amount of secretion than other parts, and the print at that point would be heaviest; that is, the pressure itself would have much to do with it. Therefore it is difficult to see why there would not be just as much success with the ink method as with some of the "chemical formula" preparations on the market, the exact compositions of which have not been divulged.

The method known as the Faurot method consists of a specially treated paper, which is used with a chemical pad that presumably does not leave a stain or discolor the skin.

Another method for fingerprinting or footprinting, which has been used with some success, is placing the fingers in a coating of petrolatum and the use of osmic acid fumes subsequently, which will bring out a good black print. Also in the case of petrolatum, Fleming's reagent fumes will bring out a very good black print or, if desired, the reagent may be used with or without petrolatum.

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NECROSPERMIA

To the Editor:—What is the cause of necrospermia? What is the treatment? Can you give references to the recent literature? A young married man, in good health, wants a child. Endocrinologic and gynecologic examinations of his wife show her to be in apparently normal condition. Examination of the husband revealed nonmotile spermatozoa of a count of 96,000,000. Repeated specimens showed the same condition, even when material was collected in an aseptic, chemically clean receptacle. Injections of antuitrin-S over a period of two months have not produced any change. The *p*H of the semen was 7.5.

M.D., Pennsylvania.

ANSWER.—Necrospermia may be artificially induced by subjecting the condom to heat, which is often done by patients who fear that the specimen might get cold while en route to the doctor. Necrospermia is always present if the specimen is examined a long time after coitus.

One must distinguish between those cases in which the testicle produces only dead spermatozoa and those in which the spermatozoa are killed after leaving the testicles by some pathologic condition in the genito-urinary tract. In the latter condition a painstaking examination of the entire tract, including in some cases a cysto-urethroscopy, must be done. The presence of many pus cells in the expressed prostatovesicular fluid is significant, not because pus kills spermatozoa but because it indicates that some disease is present which should be investigated. In some cases a congested prostate may be the cause, simply because the relief of the congestion cures the condition. It must be admitted however that sometimes examination, even if exhaustive, may fail to find the cause.

The Huhner test is sometimes of distinct value in such cases. Spermatozoa have been found alive in the female genitals after coitus, whereas repeated condom and other examinations have always shown only dead spermatozoa.

Testicular necrospermia may be caused by the application of x-rays to or in the neighborhood of the testicles even when a protective device had been used by the dermatologist or physical therapist.

A recent discussion of necrospermia may be found in Max Huhner's Diagnosis and Treatment of Sexual Disorders in the Male and Female Including Sterility and Impotence, Philadelphia, F. A. Davis Company, 1937.

OLD ULCER SCAR CAUSING NAUSEA

To the Editor:—A white woman, aged 36, complains of nausea without vomiting. She has had an appendectomy and a cholecystectomy, and six months ago a posterior gastro-enterostomy was performed for relief of partial pyloric obstruction. The cause of the obstruction as found at operation was an old ulcer scar. The nausea is apparently due to bile in the stomach, coming through the operative opening, because draining the stomach relieves the nausea. The stomach contents are chiefly bile. There is no free hydrochloric acid; the total hydrochloric acid is only 11 points. Is there any way to prevent the bile from entering the stomach? Is there any way to avoid the nauseating effect of the bile, other than intravenous administration of calcium gluconate, which has been fairly successful in this case?

R. V. BRANDON, M.D., McDonough, Ga.

ANSWER.—The case described presents many difficulties. While more surgical treatment, such as a lateral anastomosis between the afferent and efferent loops, would eliminate the reflux of bile into the stomach, it probably is unnecessary and might be followed by other untoward symptoms. Bile in the stomach is not necessarily a source of trouble. In fact, all the bile has frequently been shunted into the stomach in case of irreparable obstruction of the common duct without subsequent gastric symptoms. There is usually some reflux of bile and duodenal contents into the stomach after gastro-enterostomy. Paterson suggested that much of the virtue of the operation lay in the reduction of gastric acidity by the regurgitation of bile.

Achylia suggests that the patient is suffering from asthenia universalis, or Stiller's disease. Increasing the weight and attention to mental problems would probably accomplish more than a new operation.

SPASMS OF LEGS AT NIGHT

To the Editor:—A man, aged 62, in good general health, has occasional attacks of muscle spasms of the legs during sleep. He has never had attacks during the day. The calf of the leg, the popliteal space or the ankle is involved. On one occasion the two feet were affected at the same time. The spasm passes off spontaneously in from ten to fifteen minutes. He is a moderate smoker. The patch test for tobacco gives only slight reaction. The blood pressure is normal. Is there any contraindication to the use of tobacco? Has the condition any relation to thrombo-angiitis obliterans? What suggestions can you give for diagnosis?

M.D., New York.

ANSWER.—Since the spasms of the muscles occur at night, it is doubtful that the condition is related to thrombo-angiitis obliterans. Such symptoms are at times encountered in arteriosclerosis both of the peripheral vessels and of the spinal cord and the spinal roots. Likewise they may be the expression of tumors or inflammatory disorders of the last named structures. The possibility exists that the spasms from an unexplained increase in muscular irritability would have to be considered, in which case they should be readily relieved by mild sedatives. There would not be the same contraindication to the use of tobacco as in the instance of thrombo-angiitis obliterans. However, there is some evidence to indicate that smoking may produce a degree of vasoconstriction, a condition which presumably would have an unfavorable influence on the occurrence of such spasms.

DIPHTHERIA ANTITOXIN

To the Editor:—How late after the contraction of diphtheria is antitoxin effective?

R. L. CLINE, M.D., Lakeland, Fla.

ANSWER.—When diphtheria antitoxin is administered in sufficient dosage within the first two days of the disease, few patients fail to recover. The history of duration is often unreliable because of the insidious onset of diphtheria. Diphtheria antitoxin is efficient only in relation to its action on the free toxin; for the toxin that has combined with the body tissues, antitoxin is ineffective. Since there may be free toxin at any stage of acute diphtheria, antitoxin should always be given. The percentage of fatalities mounts rapidly with the increased number of elapsed days before antitoxin injection. Virulence of the infecting organism and degree of susceptibility of the patient are always important factors in any case of diphtheria. Patients have recovered who did not receive any antitoxin prior to the sixth or seventh day of the disease. It is wise to administer antitoxin in all active cases even if late in the disease.

NARCOLEPSY

To the Editor:—A youth, aged 18 years, 67 inches (170 cm.) tall, weighing 188 pounds (85 Kg.), has had narcolepsy since he was about 3 years of age. He is contemplating marriage in the near future and I should like advice as to whether or not it would be advisable to sterilize him.

R. C. FAUST, M.D., Eugene, Ore.

ANSWER.—Narcolepsy, or Gelineau's syndrome, as far as it is known, is not hereditary or familial. Therefore there is no reason to vasectomize a given individual with narcolepsy for purposes of sterilization. Cataplexy, which is another form of Gelineau's syndrome, must not be confused with familial periodic paralysis. The latter is familial. Assuming that the boy has a hypothalamic pituitary lesion resulting in adiposity, overweight and attacks of uncontrollable desire to sleep, it is suggested that he be placed on benzedrine sulfate in doses of 10 mg. two or three times daily. An anterior pituitary extract may be also given subcutaneously.

BLOOD IN ERYTHEMA MULTIFORME—LESIONS ON PENIS

To the Editor:—What blood picture has been observed in erythema multiforme? How often are lesions observed on the penile mucosa similar to those reported as occurring on the oral mucosa? I recently cared for a young white man with typical lesions of erythema multiforme following a mild attack of influenza. The cutaneous eruption was accompanied by a severe aphthous stomatitis (labial, gingival, buccal, palatal and pharyngeal mucosa) and by similar lesions of the glans penis. The history and Wassermann reaction were negative for syphilis and all lesions cleared in less than two weeks' time under local and general supportive treatment only.

M.D., Oklahoma.

ANSWER.—There is no distinct blood picture in erythema multiforme. Occasionally in the bullous type there may be some increase in the eosinophils.

Often in the bullous type and in the papular type there are lesions on the penile mucosa and on the vaginal mucosa, as well as on the mucous membranes of the mouth.

HYSTERECTOMY IN TABES

To the Editor:—A woman, aged 43, who states that she never had any primary or secondary lesions of syphilis and who was not treated until she developed tabetic symptoms, complains that she is unable to pass urine without pressing on the bladder. She also complains that her abdomen is getting bigger and that she has some abdominal discomfort. On examination there is a large fibroid uterus the size of a seven months pregnancy. What is the advisability of operation on tabetic patients?

M.D., Michigan.

ANSWER.—Assuming the general physical condition of the patient to be satisfactory, particularly from the cardiovascular standpoint, the fibroid uterus may be removed without regard to the tabes and with no reference to the state of the patient's serologic reactions in the blood and spinal fluid at the time of operation. Following operation it is of course advisable that she be under treatment for syphilis in order to guard against the remote possibility of difficulty with wound healing.

NO MEDICAL TREATMENT FOR CATARACT

To the Editor:—A man, aged 33, has a matured cataract in the right eye. An operation has been advised. Is there any other method recognized in treating the condition at this stage? He has been convinced by persons who were treated by a doctor in Philadelphia to try another procedure; that is, by some electrical apparatus. M.D., Pennsylvania.

ANSWER.—There is no medical or electrical treatment that will influence a mature cataract. Even though the patient is only 33 years of age it is advisable to submit to surgical treatment if for no other reason than the cosmetic purpose. Probably the worst ophthalmologic quackery of all time is the treatment of cataract by other than surgical means. The time may come when it can be done, but at present our knowledge is too limited.

MENTHOL IN URTICARIA

To the Editor:—What are the effects of administraton of menthol in angioneurotic edema? For how long a period can it be given? Can it produce any toxic symptoms, and what are these symptoms?

M.D., New York.

ANSWER.—Menthol is used externally only as a mild antipruritic in angioneurotic edema. While it also acts as an antipruritic when given internally, its effect as such is so uncertain and slight that there is no reason for employing it as a substitute for such drugs as epinephrine and ephedrine. The primary objection to its use by mouth is the irritating effect on the gastric mucosa. Toxic symptoms may occur in rare cases when given by mouth. Champeau reports grave but not fatal symptoms of cardiovascular collapse in a child, aged 4½ years, from ingestion of 6 mg. of menthol (*Bull. Acad. de méd.* **114**:448 [Nov. 19] 1935). Parenterally, toxic symptoms may be produced. The symptoms are those of paralysis of the central nervous system, especially the medulla.

LATE RESULTS OF RADIUM APPLICATIONS TO CERVIX

To the Editor:—What is the longest known delayed radium reaction from applications to the cervix? M.D., South Carolina.

ANSWER.—Vesicovaginal fistulas ascribable to radium applications usually occur within three months, not infrequently as late as six months after radium treatment, rarely after an interval of a year. Deep sclerosing lesions of the pelvis, simulating a malignant condition and really ascribable to radium reaction, may be followed by necrosis of the tissues even several years subsequent to the use of radium.

It is of the utmost importance that emphasis be placed on the factor of distance from the irradiated tissues in the susceptibility to burns and fistulas. The quantity of radium used is a lesser factor in contrast with the nearness of the application and the amount of screening employed.

SALICYLATES IN PULMONARY TUBERCULOSIS

To the Editor:—Should salicylates, especially acetylsalicylic acid, be used by patients suffering from active pulmonary tuberculosis, who, because of their tendency to raising blood, are properly known in the sanatorium as "streakers"? It has been my experience that a large percentage of such patients "streak" more easily if acetylsalicylic acid is used, so much so that I avoid its use. A former member of this staff had a similar experience. VIRGIL F. NEUMANN, M.D., Norwich, Conn.

ANSWER.—There is much justification for the suspicion that salicylates and acetylsalicylic acid cause increased blood flow in patients who "streak" blood. They have a slight tendency to increased blood flow, although the cause is not known; presumably it is due to a slight lowering of viscosity or to a change in coagulability. The degree is not great, however, and the risk is practically nil, even in serious cases. In only a few cases out of many thousands, in the experience of a large institution, has it been necessary to avoid such treatment, and then a shift to aminopyrine and caffeine has met the requirements with no ill effects.

ACHOLIC STOOLS FROM HEPATITIS

To the Editor:—Is it possible to get obstructive jaundice, with complete absence of bile in the stools, due entirely to a hepatitis, with no obstruction in the bile duct outside the liver? The question has come up in a young person who has been receiving antisyphilitic treatment.

M.D., North Carolina.

ANSWER.—It is entirely possible, in cases of severe hepatitis of the toxic type, particularly that associated with antisyphilitic treatment, for a patient to get acholic stools without any obstructive manifestations in the larger bile ducts. This case resembles that of a severe arsphenamine type of jaundice.

SALT AND CALCIUM IN TROPICS

To the Editor:—My daughter in Brazil has been urged by me to take salt in that tropical heat, whereas her dentist tells her not to because of her lack of calcium in nursing a big baby of 6 months. To what extent would the calcium need affect the need for salt in excessive perspiration? They are on the equator at sea level. M.D., Michigan.

ANSWER.—The fact that the patient is nursing a baby is no contraindication to taking salt for excessive perspiration. If the patient has a negative calcium balance, as is apparently suspected by her dentist, this should be corrected by the usual method of fortifying the diet with adequate available calcium. The patient should receive both the salt and the calcium.

SMALLPOX VIRUS FOR HERPES SIMPLEX

To the Editor:—In Queries and Minor Notes in the April 30 issue of THE JOURNAL is a question regarding the prevention of herpes simplex. I should like to add a supplementary remark with the hope that it will provoke further discussion. Smallpox virus has been advised for the immunization of patients to herpes simplex. It is done once a week for eight weeks in exactly the same way as vaccination against smallpox. It seems to be effective. It would seem important to reconcile the effect of smallpox virus with the effect of the virus isolated from herpes vesicles.

HAROLD J. HARRIS, M.D., Westport, N. Y.

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Medical Examinations and Licensure

COMING EXAMINATIONS

STATE AND TERRITORIAL BOARDS

Examinations of state and territorial boards were published in THE JOURNAL, June 11, page 2028.

NATIONAL BOARD OF MEDICAL EXAMINERS

NATIONAL BOARD OF MEDICAL EXAMINERS: *Parts I and II.* Examinations will be held in all centers where there is a Class A medical school and five or more candidates who wish to write the examination, June 20-22 and Sept. 12-14. Ex. Sec., Mr. Everett S. Elwood, 225 S. 15th St., Philadelphia.

SPECIAL BOARDS

AMERICAN BOARD OF INTERNAL MEDICINE: *Written examination* will be held at various centers of the United States and Canada, Oct. 17. *Final date for filing applications is Sept. 1.* Chairman, Dr. Walter L. Bierring, 406 Sixth Ave., Suite 1210, Des Moines, Iowa.

AMERICAN BOARD OF OPHTHALMOLOGY: Washington, D. C., Oct. 8, and Oklahoma City, Nov. 15. *All applications should be filed immediately and case reports, in duplicate, must be filed not later than sixty days before the date of examination.* Sec., Dr. John Green, 3720 Washington Blvd., St. Louis, Mo.

AMERICAN BOARD OF PEDIATRICS: Detroit, October 26; Rochester, N. Y., November 13; and Oklahoma City, November 15. Sec., Dr. C. A. Aldrich, 723 Elm St., Winnetka, Ill.

Maine March Report

Dr. Adam P. Leighton, secretary, Maine Board of Registration of Medicine, reports the written examination held at Portland, March 8-9, 1938. The examination covered 10 subjects and included 100 questions. An average of 75 per cent was required to pass. Seventeen candidates were examined, 15 of whom passed and two failed. One physician was licensed by reciprocity and one physician was licensed by endorsement after an oral examination. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
George Washington University School of Medicine		(1937)	83.5
Georgetown University School of Medicine		(1937)	87.9
University of Maryland School of Medicine and College of Physicians and Surgeons		(1937)	84.6
Boston University School of Medicine		(1923)	83.6, (1937) 84.8
Harvard University Medical School		(1935)	85.9, (1937) 84.7
Tufts College Medical School		(1917)	76.5, (1937) 78.8, 82.7
University of Rochester School of Medicine		(1936)	83.8
Jefferson Medical College of Philadelphia		(1934)	82.2
School of Medicine and Surgery of Montreal		(1911)	75.6
University of Montreal Faculty of Medicine		(1937)	76.8
Université de Paris Faculté de Médecine		(1921)	75.9

School	FAILED	Year Grad.	Per Cent
Friedrich-Wilhelms-Universität Medizinische Fakultät, Berlin		(1929)	68.1
National University of Athens School of Medicine		(1935)	55.6

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
Long Island College Hospital		(1893)	Vermont

School	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement of
Harvard University Medical School		(1935)	N. B. M. Ex.

Arizona April Report

Dr. J. H. Patterson, secretary, Arizona State Board of Medical Examiners, reports the written examination held at Phoenix, April 5-6, 1938. The examination covered 10 subjects and included 100 questions. An average of 75 per cent was required to pass. Two candidates were examined, both of whom passed. Six physicians were licensed by reciprocity and two physicians were licensed by endorsement. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
University of Illinois College of Medicine		(1937)	75.8*
University of Vermont College of Medicine		(1936)	81.3

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
School of Med. of the Division of Biological Sciences		(1931)	Illinois
Tulane University of Louisiana School of Medicine		(1932)	Louisiana
Washington University School of Medicine		(1934)	Missouri
Albany Medical College		(1930)	New York
Cleveland College of Physicians and Surgeons		(1912)	Ohio
Western Reserve University School of Medicine		(1925)	Ohio

School	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement of
College of Medical Evangelists		(1928)	N. B. M. Ex.
George Washington University School of Medicine		(1934)	N. B. M. Ex.

*This applicant has completed the medical course and will receive the M.D. degree on completion of internship.

Alabama Reciprocity and Endorsement Report

Dr. J. N. Baker, secretary, Alabama State Board of Medical Examiners, reports eight physicians licensed by reciprocity and two physicians licensed by endorsement from Jan. 12 through April 18, 1938. The following schools were represented:

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
Emory University School of Medicine		(1933)	Georgia
Northwestern University Medical School		(1922)	Iowa
Tulane Univ. of Louisiana School of Medicine		(1935), (1936)	Louisiana
Columbia Univ. College of Physicians and Surgeons		(1928)	New York
Temple University School of Medicine		(1935)	Penna.
University of Tennessee College of Medicine		(1934)	Tennessee
Marquette University School of Medicine		(1937)	Wisconsin

School	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement of
College of Medical Evangelists		(1932)	N. B. M. Ex.
University of Maryland School of Medicine and College of Physicians and Surgeons		(1925)	N. B. M. Ex.

Missouri Reciprocity and Endorsement Report

Dr. Herman S. Gove, director, Medical Licensure, reports fifteen physicians licensed by reciprocity and one physician licensed by endorsement on January 6, February 14 and April 8, 1938. The following schools were represented:

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
University of Arkansas School of Medicine		(1937)	Arkansas
College of Medical Evangelists		(1936) Michigan, (1937)	New Jersey
University of Illinois College of Medicine		(1935)	Illinois
State University of Iowa College of Medicine		(1933)	Iowa
Kansas Medical College, Kansas		(1908)	Kansas
University of Kansas School of Medicine		(1931), (1934)	Kansas
Johns Hopkins University School of Medicine		(1932)	Maryland
University of Nebraska College of Medicine		(1933)	Nebraska
University of Oklahoma School of Medicine		(1936)	Oklahoma
Medical College of the State of South Carolina		(1924)	S. Carolina
Baylor University College of Medicine		(1936)	Texas
Medical College of Virginia		(1933)	Virginia
McGill University Faculty of Medicine		(1935)	Canada

School	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement of
Harvard University Medical School		(1934)	N. B. M. Ex.

Rhode Island April Examination

Mr. Robert D. Wholey, chief, Division of Examiners, reports the oral, written and practical examination held by the Board of Examiners in Medicine at Providence, April 7-8, 1938. The examination covered 20 subjects and included 50 questions. An average of 80 per cent was required to pass. Five candidates were examined, all of whom passed. Five physicians were licensed by endorsement after an oral examination. The following schools were represented:

School	PASSED	Year Grad.	Per Cent
Tufts College Medical School		(1936)	87.5
Cornell University Medical College		(1935)	87
Jefferson Medical College of Philadelphia		(1930)	83.5
University of Toronto Faculty of Medicine		(1924)	81
Regia Università degli Studi di Roma. Facoltà di Medicina e Chirurgia		(1934)	83

School	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement of
College of Medical Evangelists		(1937)	N. B. M. Ex.
Georgetown University School of Medicine		(1936)	N. B. M. Ex.
Johns Hopkins University School of Medicine		(1932)	N. B. M. Ex.
Harvard University Medical School		(1933), (1935)	N. B. M. Ex.

Iowa Reciprocity and Endorsement Report

Mr. H. W. Grefe, director, Division of Licensure and Registration, reports fifteen physicians licensed by reciprocity and five physicians licensed by endorsement from Jan. 3 through April 20, 1938. The following schools were represented:

School	LICENSED BY RECIPROCITY	Year Grad.	Reciprocity with
Loyola University School of Medicine		(1933)	Illinois, (1937) Ohio
Northwestern Univ. Medical School		(1937)	Illinois, Kansas, Michigan
Rush Medical College		(1931)	Illinois
Wayne University College of Medicine		(1937)	Michigan
Univ. of Minnesota Medical School		(1926)	Minnesota, (1937) New York
Washington University School of Medicine		(1932)	Missouri
Creighton University School of Medicine		(1936)	Kansas
Univ. of Nebraska College of Medicine		(1928), (1934), (1935)	Nebraska
Marquette University School of Medicine		(1936)	Wisconsin

School	LICENSED BY ENDORSEMENT	Year Grad.	Endorsement of
College of Medical Evangelists		(1937, 2)	N. B. M. Ex.
University of Colorado School of Medicine		(1934)	N. B. M. Ex.
Harvard University Medical School		(1934)	N. B. M. Ex.
Columbia Univ. College of Physicians and Surgeons		(1927)	N. B. M. Ex.

Book Notices

Heart Disease in General Practice. By Paul D. White, A.B., M.D., Assistant Professor of Medicine, Harvard University Medical School, Boston. National Medical Monographs. Edited by Morris Fishbein, M.D. Cloth. Price, $3. Pp. 338, with 47 illustrations. New York: National Medical Book Co., Inc., 1937.

Dr. White, the author of this book, is one of the leading cardiologists of the United States. In the preface he states that the book is an "attempt to serve the family physician by compiling a brief but practical and forceful summary of our present knowledge of the diagnosis, prognosis and treatment of heart disease." He employs the question and answer method and has included many of the questions of the general practitioner. The book is divided into four parts: the historical introduction (7 per cent), the field of diagnosis including symptomatology, signs, blood pressure, electrocardiography and x-ray examination (48 per cent), prognosis (4 per cent) and treatment (34 per cent); the remainder consists of preface and index. Selecting at random pregnancy and heart disease as one of the common problems of the general practitioner, one finds this subject considered with a single question and a two page answer. The discussion does not include prevention or treatment of congestive failure. Taking the management of acute coronary thrombosis as another question, there is an excellent summarization of the modern concept of diagnosis and the treatment of this common problem. Another question is that of treatment of cardiovascular syphilis, in which Dr. White advocates potassium iodide, mercury or bismuth compounds and neoarsphenamine up to 0.4 Gm., which might lead a practitioner into serious complications. On the whole the book is well arranged and the discussions of the various topics represent current views in modern cardiovascular practice. One might be critical of the attempt to summarize such a broad subject in such a small book. The volume will prove interesting reading to a number of practitioners, and they hold the ultimate answer as to whether or not Dr. White has achieved his purpose.

The British Encyclopaedia of Medical Practice Including Medicine, Surgery, Obstetrics, Gynaecology and Other Special Subjects. Under the General Editorship of Sir Humphry Rolleston, Bt., G.C.V.O., M.D. Volume VI: Gonorrhoea to Hydrotherapy. Cloth. Price, $12. Pp. 602, with 96 illustrations. London & Toronto: Butterworth & Co. (Publishers), Ltd., 1937.

From "gonorrhoea" to "hydrotherapy" is the field covered by the sixth volume of this encyclopedia, the leading titles including some fifteen pages on gout, seventy-five pages on topics beginning with "hema," twenty-seven pages on the hand and 150 pages on the heart. Other important headings concern heat, heredity and hernia. The authors of note in this volume are Colonel Harrison, who writes on gonorrhea on the basis of a large experience during the Great War and since, and many leading British physicians whose names are associated with diseases of the blood. Whitfield discusses the hair and Reginald Miller in a succinct statement gives the important facts regarding rheumatic heart disease in children. The name of C. P. Symonds is associated with articles on headache and on hydrocephalus. The volume is fully up to the standard of the previous volumes in typography, illustration and the quality of the material.

The Income Structure of the United States. By Maurice Leven. Assisted by Kathryn Robertson Wright. Cloth. Price, $1.50. Pp. 177. Washington, D. C.: Brookings Institution, 1938.

The more the income problem is studied the more complex it becomes. It is not always the same as money received or expended. There are still important survivals of "barter economy." There are wide variations as to industries and as to occupations within industries. Business incomes are modified by lobbying, legislation, trade associations and business combinations. Farmers' incomes are affected by legislation and cooperative organizations as well as by location. The influence of unions on labor incomes is steadily growing. The cyclic fluctuations change total income and also its distribution among individuals and groups. Seasonal conditions, strikes, technologic developments and the existence of largely immobile and stranded populations greatly affect the picture. Hourly wages appear to have increased somewhat since 1929, but as the length of the working week has declined "total annual wages in 1936 were, however, below the preponderance level." There are, however, numerous exceptions to this statement. Of eighty-nine industries, thirty-one had higher weekly earnings in June 1937 than in 1929. If increase in productivity is sufficiently raised, living standards may not suffer from shortened hours. The decline in incomes since 1929 has hit professional workers somewhat harder than the rest of the population. "The professional incomes of physicians in the 1936 array were between 18 and 30 per cent lower than in the 1929 array; lawyers' incomes were between 18 and 38 per cent lower in the array for 1936 than in that for 1929." Wages and salaries have shown wider fluctuations and somewhat more of a recovery from the depression low than "entrepreneurial withdrawals." Dividends and interest were least affected by the cyclic change. While "most of the *employed* industrial wage earners seem to have forged ahead of their predepression position by the middle of 1937, this gratifying condition, however, was marred by the fact that in 1937, even before the recession in the latter part of the year, there were still some 8 to 9 million people unemployed in the United States." The latter number is close to the additional wage earners created by the increase in population during these years.

Annual Reprint of the Reports of the Council on Pharmacy and Chemistry of the American Medical Association for 1937 with the Comments That Have Appeared in The Journal. Cloth. Price, $1. Pp. 201. Chicago: American Medical Association, 1938.

This issue of the collected reports includes the reports on Avertin with Amylene Hydrate (now accepted for New and Nonofficial Remedies), Benzedrine Sulfate (the active constituent of the notorious "pep" pills but a promising drug when its limitations are recognized), Catgut Sutures (a survey of the sterility of the market supply), Evipal Soluble (a comprehensive review of the evidence for the usefulness and limitations of the drug), Histidine Hydrochloride (a study of the usefulness of the drug in peptic ulcer, to be considered in connection with the report rejecting Larostidin, a proprietary brand, for unwarranted and exaggerated claims), Mandelic Acid (an authoritative statement of the limitations of this drug which the Council has now accepted), and Vinethene (a careful study of the evidence for the drug, which the Council has accepted for one year as an anesthetic to be used in short procedures).

Two reports of interest to those who have been following the Council's considerations are those finally rejecting Edwenil and Gonococcus Filtrate (Corbus-Ferry). The Edwenil report represents a thoroughgoing demolition of the exaggerated claims that have been made for this pseudoscientific preparation. The report on Gonococcus Filtrate is the third of a series of reports illustrating the patient carefulness with which the Council considers the evidence for a preparation and the progressing failure of the evidence for Gonococcus Filtrate to substantiate the promise which it at first appeared to show. Another illustration of the Council's recurrent consideration of a product is the report on Pantopon "Roche." Since the omission of this product from New and Nonofficial Remedies in 1931, the Council has at various times been forced to consider promotional material issued by the manufacturer repeating and emphasizing the extravagant and unwarranted claims because of which it had been omitted.

Other reports of outright rejection of products are those on Causalin (Causyth), an unsafe and dangerous preparation proposed for use in arthritis; Glutamic Acid Hydrochloride-Calco, proposed as a conveyor of hydrochloric acid, with unsubstantiated claims of clinical effectiveness, and Larodon "Roche," proposed as a substitute for other well established analgesic and antipyretic drugs and marketed with exaggerated and unwarranted claims.

The Council's constant and increasing interest in vitamin therapy is shown in the following reports: ConDol and Ertron Not Acceptable for N. N. R., a rejection of two high potency vitamin D preparations proposed for use in the treatment of arthritis; Dosage of Preparations Containing Vitamins A and D, an attempt to bring some uniformity into the dosage statements for the various accepted vitamins A and D preparations;

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The Use of Hydroquinone as a "Stabilizing" Agent in Preparations Containing Vitamin A, a rejection of such use; Riboflavin, the accepted name for Vitamin B_2; and Thiamin Chloride, the Council's new name for the hydrochloride of Vitamin B_1, and Viosterol (A. R. P. I. Process) in Oil.

The report on omission of Pentobarbital Sodium-Abbott should be mentioned in connection with the Council's interest in nomenclature of drugs. Since 1931 the Council has accepted two brands of pentobarbital sodium. Claiming priority for its product, the Abbott Laboratories has for some time insisted on the use of the proprietary name "Nembutal" for pentobarbital sodium. Perusal of the lengthy report vindicates the Council's attitude on the use of proprietary names. It should be read by all who may be disposed to regard such matters as of relative importance. Further exposition of the Council's attitude on nomenclature is found in the report on the controversy with Sir Henry Dale over the name Ergonovine.

Two reports on Sulfanilamide appear, a nomenclature and status report together with reprints of THE JOURNAL editorials giving the warnings which, if obeyed, would have avoided the series of deaths which resulted from the marketing of the ill fated Elixir of Sulfanilamide-Massengill.

At the end of this volume appears a eulogy of George Henry Simmons, whose death deprived the Council on Pharmacy and Chemistry of its founder and American medicine of a worthy and faithful servant.

The Time Has Come . . . By Sir Arthur Hurst, M.A., D.M., Senior Physician to Guy's Hospital. The Harveian Oration Delivered Before the Royal College of Physicians of London on St. Luke's Day, 1937. Cloth. Price, 5s. Pp. 42. London: Headley Brothers [n. d.].

This is the two hundred and eighteenth Harveian oration delivered before the Royal College of Physicians in London. The first of the lectures to be delivered in English was given in 1865, although Harvey left the injunction that the oration should be in Latin. While the name of Harvey is closely associated with his studies of the circulation, he also made fundamental observations on the stomach and the digestion. Sir Arthur Hurst reviews contributions to the advancement of this phase of medical science and in the introduction and in the conclusion of his oration refers to the nature and purpose of the establishment of the Harveian oration. Since the time of Sir Henry Halford, who was president of the Royal College of Physicians between 1820 and 1844, only one physician, Lord Dawson, has occupied that chair for seven consecutive years.

Baron Constantin von Economo: His Life and Work. By his Wife and by Prof. J. von Wagner-Jauregg. Translated from the second German edition by Ramsay Spillman, M.D. Cloth. Price, $2. Pp. 126, with illustrations. New York: Ramsay Spillman, 115 East 61st Street, 1937.

Von Economo's researches were fundamental and opened a new pathway to the study of human behavior. His biography is written by his wife, who disavows any pretense to literary style yet by that very factor gives truth and personality to her writings. Few people know that von Economo was an enthusiast in aeronautics, including the balloon and the airplane, holding high office in organizations devoted to such work and sport. During the World War he served with the Austrian army on the Russian front and later in the Tyrol in 1916. Following the death of his brother in the service he returned to Austria to join the Wagner-Jauregg clinic. Von Economo was a learned man who read widely in the classics and was familiar also with art and music. His drawings of portions of the brain and of the special senses are described as "little works of art." He proposed that the brains of great men be saved for scientific study. During his career he twice visited the United States, the last visit, in 1929, including the eastern seaboard from Boston to Miami. He died in October 1931 from a severe angina. The brief record of his life is followed by an appreciation of his scientific work by Wagner-Jauregg and a reprinting of some of his most significant contributions. The name of von Economo is particularly associated with the identity of the condition now called epidemic encephalitis or lethargic encephalitis. Toward the end of his career von Economo was instrumental in establishing in Vienna an institute for brain research. Then he died and his right-hand man, Dr. Horn, survived him but a short time. With them the institute for brain research disappeared. Considering the recent changes that have taken place in medicine in Vienna, it is perhaps just as well that these scientists should have completed their own contributions and passed on before the inevitable heartbreak that would have come to them in recent years.

Traumatismes du pied et rayons X: Malléoles, astragale, calcanéum, avant-pied. Par Etienne Destot. Préface du Dr Alexis Carrel. Second edition. Paper. Price, 45 francs. Pp. 292, with 156 illustrations. Paris: Masson & Cie, 1937.

Even though this book is by an eminent surgeon of France, carrying a foreword by Alexis Carrel, it is merely a catalogue, with innumerable roentgenographic illustrations, of fractures at the ankle and tarsus. There is little on treatment and practically no method of reduction or immobilization is described or illustrated. Destot was one of the first French surgeons to appreciate the value and the limitations of the roentgen ray in surgery of fractures. From the extensive array of roentgenograms of old improperly healed or reduced fractures of the ankle and tarsus one would be inclined to believe that the x-ray method had been neglected for both immediate diagnosis and position determination of fragments and also for the x-ray record of the proper reduction. There is absolutely no mention of the Boehler salient for the linear determination of reduction of the fracture of the os calcis, and this does seem to offer definite help. Destot died in 1918 following arduous surgical service and roentgen exposure during the war period. This edition has been revised by two admiring pupils and associates. It is a voluminous French essay on fractures of a limited but important part of the body but it does not begin to be a complete treatise of any great practical value to the American industrial or railroad surgeon or general practitioner. The book shows how Destot can adorn the tarsus with beautiful word-flowers, only to have them wilt under the scorn of this practical analysis of their true values.

Pathology. By E. B. Krumbhaar, M.D., Professor of Pathology University of Pennsylvania School of Medicine, Philadelphia. XIX, Clio Medica: A Series of Primers on the History of Medicine. Edited by E. B. Krumbhaar, M.D. Cloth. Price, $2. Pp. 206, with 18 illustrations. New York: Paul B. Hoeber, Inc., 1937.

The little volumes published as a medical historical collection under the title "Clio Medica," begun by the late Paul B. Hoeber, now occupy a sizable area on the book self. Since pathology is basic in the development of every branch of medical science, Krumbhaar's contribution is one of the most significant in the series. He has divided his work into a series of chapters dealing with early concepts, the rise of the anatomic concept in disease, precellular and cellular pathology, and finally integrated pathology. Quite as valuable as the text itself are the series of appendixes dealing with the word "pathology," early chairs for the teaching of the subject, and a chronologic list of milestones. There is also a bibliography and a good index. The very concentration of the work inclines to make it well nigh a list of names, dates and accomplishments, yet the author has been able, here and there, to introduce something of literary flavor.

Medico-Legal Aspects of the Ruxton Case. By John Glaister, M.D., D.Sc., Barrister-at-Law, Regius Professor of Forensic Medicine, University of Glasgow, and James Couper Brash, M.A., M.D., F.R.C.S., Professor of Anatomy, University of Edinburgh. Cloth. Price, $6. Pp. 284, with 172 illustrations. Baltimore: William Wood & Company, 1937.

This is not the kind of book that can be recommended to readers of detective stories. It is a scientific work describing the medicolegal aspects associated with two murders in which the victims were terrifically mutilated. The victims were the wife of a physician and the nursemaid from the physician's home. The doctor was charged with the murders, tried and convicted. From this conviction he appealed and the appeal was dismissed. As it was necessary to reconstruct the bodies from the remains, to determine their sex and to identify them, to analyze the feet and the fingerprints and to make anthropologic studies of the skulls and to reconstruct the face from these portions, the book offers opportunity for a vast amount of instruction on identification. There was also the question of blood stains found on clothing and on the household furnishings and identification of this material. The book is illustrated and should be of special interest to all who carry on medicolegal work.

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The Treatment of Clinical and Laboratory Data: An Introduction to Statistical Ideas and Methods for Medical and Dental Workers. By Donald Mainland, M.B., Ch.B., D.Sc., Professor of Anatomy, Dalhousie University Halifax, Nova Scotia, Canada. Cloth. Price, 15s. Pp. 340, with 23 illustrations. Edinburgh & London: Oliver & Boyd, 1938.

This is a welcome addition to the books now available on the statistical method in biologic and medical research. Because of its emphasis on biologic and medical problems and the deletion of all but the most necessary mathematical formulas, it is exceptionally readable. Many important aspects of the statistical method are brought out and illustrated with actual examples. The explanation of the use of the chi square test, for instance, is brief and lucid. In fact, any one with a high school education and a small amount of concentration could readily understand its applicability. For those desiring to go somewhat more deeply into the subject, there is a chapter of supplementary notes which, while more complicated, is nevertheless simply and clearly presented. There would now seem to be no excuse for the presentation of statistically oriented medical papers without some conception of the statistical elements involved and the pitfalls most commonly encountered.

Materia Medica, Pharmacology, Therapeutics and Prescription Writing for Students and Practitioners. By Walter Arthur Bastedo, Ph.M., M.D., Sc.D., Consulting Physician, St. Luke's Hospital, New York. Fourth edition. Cloth. Price, $6.50. Pp. 778, with 81 illustrations. Philadelphia & London: W. B. Saunders Company, 1937.

This edition has been revised and many new parts have been added. The textbook is designed particularly for students and practitioners; the author states in the preface that it is for the practicing physician rather than for the scientist. It differs from other standard textbooks of this type in that it consists essentially of the author's lectures and, while it is interesting reading, it is less suitable for detailed reference work since it does not contain (any more than a lecture would contain) the bibliography on which the material is based. The author makes full acknowledgment of many source books. All the newer drugs are discussed in full detail and the evaluation of the current references to the literature is a reflection of the author's ability in this field. Examples of such critical review are the discussions of the mariahuana habit, cyclopropane, mandelic acid and sulfanilamide. The volume includes discussion of prescription writing and posology. This edition should have the success of its predecessors.

Sbornik posvyashchenny 35-letiyu vrachebnoy, nauchnoy, prepodavatelskoy i obshchestvennoy deyatelnosti zasluzhennogo deyatelya nauki Professora Alekseya Ivanovicha Abrikosova. Pod redaktsiey Prof. P. D. Solovova. [Collection Celebrating 35 Years of Professional, Scientific and Communal Activity of Professor Aleksey Ivanovich Abrikosov.] Cloth. Price, 11 rubles, 50 kopecks. Pp. 364, with illustrations. Moscow & Leningrad: Gosudarstvennoe izdatelstvo biologicheskoy i meditsinskoy literatury, 1936.

This is a collection of papers by the staff of the Botkin Hospital, Moscow, presented to the pathologist A. I. Abrikosov on the occasion of the completion of thirty-five years of his scientific and pedagogic activities. The major part of the papers is devoted to anatomic and pathologic subjects. They reflect a fairly high level of accomplishments in the field in which Abrikosov, their teacher and co-worker, is a prominent figure.

The Public Assistance Worker: His Responsibility to the Applicant, the Community, and Himself. Edited by Russell H. Kurtz. Cloth. Price, $1. Pp. 224. New York: Russell Sage Foundation, 1938.

The extraordinary expansion and transformation of nearly all phases of public assistance during recent years have called for new attitudes and ability to meet new tasks on the part of those concerned with public assistance. Permanent state public welfare agencies have succeeded state emergency relief administrations and are seeking to coordinate all types of public assistance. Each chapter is by a different author, yet the book as a whole is consistent and well organized. The old attitudes toward standards of need, residence requirements and other traditional qualifications for relief which characterized the old Poor Law are disappearing. Cash relief, with the individual right to choose how it will be expended, is approved. The problems of health and medical care are considered, with thorough recognition of the necessity of individualizing the problem and giving the patient the right to choose his own physician. While it is stated that "there is a strong case to be made for health insurance," the objections to it on the ground that it "lowers the quality of medical care, the quality of the medical man, and the quality of the patient's conception of health" and also that "no compulsory insurance scheme would provide medical care to all persons who need services at low cost" are recognized. Emphasis is rightly laid on the problems of housing, nutrition and income in relation to disease and the place of public health departments in caring for community conditions.

Diseases of the Blood. By Cyrus C. Sturgis, M.D., B.S., Professor of Medicine, University of Michigan Medical School, Ann Arbor, Michigan, and Raphael Isaacs, A.B., A.M., M.D., Associate Professor of Medicine, University of Michigan Medical School, Ann Arbor, Michigan. National Medical Monographs. Edited by Morris Fishbein, M.D. Cloth. Price, $3. Pp. 302, with one illustration. New York: National Medical Book Co., Inc., 1937.

During the last few years there has been a remarkable growth of interest in the diseases of the blood. Several large monographs, beautifully illustrated with color plates, have appeared within a short time. While these large books have been welcomed by hematologists, clinical pathologists and internists, there has been a decided need for a small, reasonably priced, lucid and authoritative book particularly planned for the general practitioner. This monograph admirably fulfils these requirements. The broad experience of the authors in the clinical management of diseases of the blood, as well as their well known contributions to hematologic research, provided them with a wealth of material from which to select the subject matter. Details of technic and illustrations of the various blood cell types have been omitted. The relative length of the subject matter in the various chapters parallels the clinical importance of the various diseases. Thus the chapter on pernicious anemia occupies fifty-seven pages, while that on sickle cell anemia occupies but nine pages. Proper emphasis is given to the treatment of the various diseases of the blood and the blood-forming organs. The book is written in a clear, concise, eminently readable style and is printed in large, legible type. It richly deserves the favorable reception it is certain to receive from the general practitioner.

Treatment in General Practice. By Harry Beckman, M.D., Professor of Pharmacology at Marquette University School of Medicine, Milwaukee, Wis. Third edition. Cloth. Price, $10. Pp. 787. Philadelphia & London: W. B. Saunders Company, 1938.

The third edition of this work is no larger than the previous two editions, because experience has enabled the author to eliminate some material and to condense some portions of the book. There has been reorganization of the material by including diabetes with the endocrine diseases and giving obesity and malnutrition a separate section. The new section which has been added deals with nutritional disturbances, diseases of the liver and bile passages, disturbances of water, salt and protein balance, those caused by heat, and the anemias. A number of conditions are now considered for the first time, notably alkalosis, Ménière's disease, physical allergy, prophylaxis of the venereal diseases, colon consciousness, and some ear, nose and throat disturbances. Obstetric conditions, drug addiction and some tropical conditions have been eliminated from consideration. The work continues to be one of the most practical that are available in the field of therapy, is easily understood, and for the most part is abreast of the times. However, some new promising forms of therapy which are not perhaps as yet well established have not been included, notably in the treatment of psoriasis and in pneumonia.

English-German and German-English Medical Dictionary. By Joseph R. Waller, M.D., and Moritz Kaatz, M.D. Teil 2: Deutsch-Englisch. Englisch-Deutsches und Deutsch-Englisches medizinisches Wörterbuch. Seventh edition by Dr. Franz von Braitenberg. Cloth. Price, 7 marks. Pp. 238. Leipzig & Vienna: Franz Deuticke, 1938.

The seventh edition of this useful little dictionary is to all intents and purposes simply a new printing of the sixth edition. It contains no new material, and the old definitions are unchanged. The noteworthy feature of the book is, as before, the limitation of its vocabulary to strictly medical terms. It includes a surprisingly large number of words within its small confines. The medical student, general practitioner or layman unfamiliar with medical terminology will find it very helpful.

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The Diary of a Surgeon in the Year 1751-1752. By John Knyveton, Licentiate of the Society of Apothecaries; Doctor of Medicine of the University of Aberdeen; Teacher of Midwifery to and Man Mid-Wife in Infirmary Hall; Surgeon's Mate, H. M. S. Lancaster. Edited and transcribed by Ernest Gray. Cloth. Price, $2.50. Pp. 322, with 9 illustrations. New York & London: D. Appleton-Century Company, Incorporated, 1937.

The lives of physicians are romantic. They are particularly romantic in the period covered by this diary. The diary is pieced together much as one might piece together a piece of fiction based on the diaries of Evelyn, Pepys and Walpole. This book is apparently based on the autobiography of Thomas Denman, to which are added statements by his son-in-law Matthew Baillie as they appeared in his seventh edition of "Practice of Midwifery." Names and dates are changed in some instances. This leads to errors, such as when the diarist speaking of the treatment of scurvy, presumably in 1751, refers to James Lind's "On the Diseases of Europeans in Hot Climates," which did not appear until 1768. The book presents an interesting picture, and the diary method gives it a tone of veracity which adds to its flavor.

Sbornik posvyashchenny 35-letney vrachebnoy, nauchnoy i obshchestvennoy deyatelnosti professory Vladimira Nikolaevicha Rozanova. Redaktor: Prof. P. D. Solovov. [Collection Celebrating 35 Years of Professional, Scientific and Communal Activity of Professor Vladimir Nikolaevich Rozanov.] Cloth. Pp. 359, with illustrations. Moscow & Leningrad: Gosudarstvennoe meditsinskoe izdatelstvo, 1934.

This is a collection of papers presented by the staff of the Botkin Hospital, Moscow, to V. N. Rozanov, chief of the surgical division of the hospital, on the occasion of completion of thirty-five years of his clinical, pedagogic and investigative activities. Most of the papers deal with surgical subjects. The quality of the surgical work reflected in these contributions is a compliment to Rozanov, who has contributed much to the development of the surgical service at the Botkin Hospital.

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Practical Bacteriology, Haematology and Animal Parasitology. By E. R. Stitt, M.D., Sc.D., LL.D., Paul W. Clough, M.D., Chief of Diagnostic Clinic, Johns Hopkins Hospital, Baltimore, and Mildred C. Clough, M.D. Ninth edition. Cloth. Price, $7. Pp. 961, with 208 illustrations. Philadelphia: P. Blakiston's Son & Company, Inc., 1938.

The standards of the ninth edition of this reference book have been well maintained. As in the past, special emphasis has been laid on the interpretation and diagnostic significance of laboratory procedures. Advance in this field has necessitated considerable revision and addition especially with regard to filtrable viruses and hematology. An entirely new chapter on the fungi has been prepared, and it was necessary largely to rewrite the chapter on immunity and hypersensitiveness. The concise and careful descriptions in this book keep it a practically necessary fixture in the laboratories of all those physicians carrying out any but the simplest technics.

The Tercentenary of Harvard College: A Chronicle of the Tercentenary Year 1935-1936. Cloth. Price, $4. Pp. 492, with 37 illustrations. Cambridge, Massachusetts: Harvard University Press, 1937.

This volume includes the story of the tercentenary, beginning with organization and preparation, and a description of the university, of the special settings provided, a chronicle of the tercentenary year, and a complete report of each of the days. Included also are the addresses made by various speakers, the congratulatory messages and a complete list of all those who collaborated on the various occasions. The volume is handsomely published by the Harvard University Press and is a fitting memorial of a great occasion.

Biodinamika proteidiv. Pid redaktsieyu akademika O. O. Bogomoltsya. [Biodynamics of Proteins.] Paper. Price, 5 krb. 50 kopecks. Pp. 241. Kiev: Vidavnitstvo Akademii Nauk URSR, 1938.

The discussion of the nature of proteins presented in this volume is abreast of the times and is quite exhaustive. The volume emanates from the Institute of Clinical Physiology, a branch of the Ukrainian Academy of Sciences. Since it is written in the Ukrainian it will be not accessible even to those workers—physiologic chemists—who would naturally be most interested in it. Such valuable contributions should, in the interest of interchange of ideas, be rendered into one of the more accessible languages.

Bureau of Legal Medicine and Legislation

MEDICOLEGAL ABSTRACTS

Workmen's Compensation Acts: Pneumonia Attributed to Lowered Resistance Resulting from Industrial Accident.—A workman, in the course of his employment, August 22, ran a sliver into his finger. Infection followed and on September 5 he sought treatment at a first aid hospital maintained by his employer. There he was treated for eight days and then discharged. He lost no time from work. The following April, about eight months after the accident, he contracted pneumonia and died. His widow was awarded compensation under the Michigan workman's compensation act, on the theory that the infection from his finger injury "caused his system to run down, with a lowering of resistance, so as to make him susceptible to pneumonia." The employer appealed to the Supreme Court of Michigan.

At the hearing before the department of labor on the widow's claim for compensation, the widow testified that the deceased, after he had been discharged from the employer's first aid station, continued to suffer pain in his injured finger; that he would wake up in the middle of the night and bathe his finger in epsom salts and hot water; that after the injury he lost weight and became irritable, and that progressively his system ran down so that he caught the cold which resulted in the fatal pneumonia. It was testified, too, that the decedent perspired heavily from his work and that he stood in a place where he might easily have caught cold from a draft. There was other slight evidence that the deceased had lost weight following his injury and thereafter worked with a bandage over his gloves. Medical testimony in response to a properly framed hypothetical question attributed the pneumonia to decedent's lowered resistance caused by the infection in the finger.

It is well settled, said the Supreme Court, that if a person, as the result of an industrial accident, becomes so run down and his resistance is so lowered that the injury contributes to pneumonia, and this is borne out by medical experts, recovery may be had under the Michigan workmen's compensation act. The Supreme Court of Michigan has no right to pass on the weight of the testimony, even though it might readily reach a different conclusion than that of the trial tribunal. There being some testimony to support the widow's claim, this court must affirm the award.

The award in favor of the widow was accordingly affirmed, although modified in some respects not material to this abstract. —*Seifman v. Ford Motor Co. (Mich.), 276 N. W. 472.*

Workmen's Compensation Acts: Diabetic Gangrene Attributed to Trauma.—Sutlief had been suffering from diabetes mellitus for about two years, gradually losing weight but continuing to work. In the course of his employment he "bumped" his right leg. He finished his day's work, but when he arrived home he was pale and limped. That evening his wife noticed a small red spot on the inside of his right leg at or about the knee. She then applied a bandage, saturated with alcohol, to his right knee to relieve the pain. He worked the next day until noon, when his leg became so painful that he was forced to quit work. A physician, called the following day, found a small red spot on the outside of his knee but noticed no abrasion or break of the skin. Hot dressings and an electric pad were applied in accordance with the physician's orders but the injured workman grew worse. A few days later a blister appeared three or four inches below the knee, which "showed signs of wet gangrene." Death occurred about one month after the accident. The attending physician certified that "The Primary Underlying Cause of death was Diabetes Mellitus Duration 2 yrs."; that a contributory cause was "diabetic Gangrene Duration 1 mo."; and that the disease or injury was in no way related to the occupation of the deceased. The

industrial commission denied compensation to the widow and she appealed to the Supreme Court of Minnesota.

In determining the origin of the gangrene, apparently no importance was attached to the application of the bandage saturated with alcohol or of the hot dressings and electric pad. Two medical experts testified on behalf of the widow, one of them the attending physician, and their testimony, said the court, may have "made a prima facie case." A physician who appeared as a witness on behalf of the employer testified, however, that there was no causal relation between the accident and the workman's death; in his judgment, if the accident had played a part in the development of the gangrene, the effect of the trauma would have appeared where the injury occurred, if there was "a break in the skin in that area." The fact that the blister appeared elsewhere meant, according to this witness, that the accident had nothing to do with it; there must have been a break in the skin from some other cause. If there was a break in the skin at the toes, the trouble would work upward through the lymphatics, but such conditions do not work downward in that way. Such a disorder as that from which the deceased died does not develop without some point of entry. The record does not show whether the testimony of this witness referred to the development of moist gangrene or of infection or of both.

The causal relation, said the Supreme Court, between the accident and the resulting condition of Sutlief was obviously a question of fact for the triers of fact, the industrial commission. This court, as a court of review, cannot try such issues. Its only authority was to determine "whether there is any evidence tending to support a given finding, and whether the evidence conclusively establishes a particular fact," both of which "are deemed questions of law." The court concluded that there was sufficient evidence on which the industrial commission could base its judgment and accordingly affirmed the order of the industrial commission denying compensation to the widow.—*Sutlief v. New Richland Produce Co. (Minn.), 275 N. W. 692.*

Workmen's Compensation Acts: Massage as Constituting "Medical Services."—The employee received an injury to his back and on the recommendation of his attending physician obtained the services of an experienced masseur, who administered treatment under the supervision and control of the physician. In a proceeding under the workmen's compensation act by the employee, the masseur filed a claim to collect the amount due him for the treatment administered. The trial court entered a decree ordering the claim paid, and the insurer appealed to the Supreme Judicial Court of Massachusetts.

An insurer, said the court, under the workmen's compensation act may be required to furnish as part of the compensation to which an injured employee is entitled "adequate and reasonable medical and hospital services, and medicines if needed, together with the expenses necessarily incidental to such services." The words "medical services" have been held to include the services of a nurse or trained attendant rendered under the direction and control of a physician. *Meuse's Case*, 262 Mass. 95, 159 N. E. 636. Where, as in the present case, massage treatments are necessary, are prescribed by the attending physician and are given under his supervision and control they, the court said, constitute "medical services" within the meaning of the workmen's compensation act.

The massage treatments were given more than two weeks after the time of the employee's injury. The workmen's compensation act in its original form required the insured to furnish medical and hospital services only during the first two weeks following an employee's injury. Subsequently the act was amended to authorize the board in its discretion to require the insurer to furnish such services for a longer period "in unusual cases" and in "cases requiring specialized or surgical treatment." The insurer contended that the words "specialized or surgical treatment" should be taken to mean only that type of treatment which can be given by a physician or a surgeon who is a "specialist." In the opinion of the court, however, the words "specialized . . . treatment" do not limit treatment to such as can be given by a physician who is an expert. It is common knowledge, the court observed, that in modern times practitioners of medicine in the treatment of their patients not infrequently call to their aid persons not physicians or surgeons whose experience, knowledge and training enable them to contribute treatment beneficial to the patients. Roentgen and other light treatments, the application of heat, massage, and other treatments by persons specially trained and equipped are often prescribed by physicians to aid in the cure or in the relief of their patients. The court thought that massage prescribed by an attending physician and given under his supervision and control by an experienced masseur was "specialized . . . treatment" within the meaning of the act.

The decree entered by the trial court in favor of the masseur was therefore affirmed.—*Haggerty's case (Mass.), 11 N. E. (2d) 583.*

Contraceptives: Right of Municipality to Regulate Distribution of Contraceptives.—An ordinance of Knoxville, Tenn., makes it unlawful for any person other than a licensed physician or a registered pharmacist to sell, give away or otherwise distribute "any appliance, drug or medicinal preparation intended or having special utility for the prevention of conception and/or venereal disease." In no event is distribution to be authorized to persons 18 years old and under. The defendant, who operated a small stand from which he sold articles such as candy, chewing gum and razor blades, was convicted of violating this ordinance by selling condoms. He appealed to the Supreme Court of Tennessee.

The defendant insisted that the ordinance was invalid because it gave to a special group of merchants privileges which it denied to others, in violation of provisions in the state constitution. He argued that the handling of condoms does not require any special or technical knowledge. Condoms, he argued, may be compared to "patent medicines" in that they are prepared ready for immediate use and sold to consumers in the original packages, without further preparation or instructions and without the necessity of any special or technical knowledge on the part of the vender.

If, said the Supreme Court of Tennessee, any possible reason can be conceived to justify a classification contained in a legislative enactment, it will be upheld and deemed reasonable. The classification contained in the ordinance under consideration, the court thought, was natural and reasonable. Certainly, the prohibition of the sale of contraceptive goods, except by a licensed pharmacist or by a licensed physician and then only to persons more than 18 years of age, tends to preserve public morals as well as the health and safety of the people of the community. It cannot be doubted that the indiscriminate sale of contraceptive goods by pedlers and vending machines, at stores and filling stations, is a menace to the morals and health of the people. Under the charter of the city of Knoxville (chapter 412, Private Acts, 1923) the city is given broad and full power "To define, prohibit, suppress, prevent, and regulate all acts, . . . and all other things whatsoever detrimental to the health, morals, comfort, safety, convenience or welfare of the inhabitants of the city." The ordinance in question, said the court, is valid and constitutional and accordingly the court affirmed the judgment of the trial court.—*McConnell v. City of Knoxville (Tenn.), 110 S. W. (2d) 478.*

Society Proceedings

COMING MEETINGS

American Association for the Study of Neoplastic Diseases, Baltimore, June 23-25. Dr. Eugene R. Whitmore, 2139 Wyoming Ave. N.W., Washington, D. C., Secretary.

American Urological Association, Quebec, Canada, June 27-30. Dr. Clyde L. Deming, 789 Howard Ave., New Haven, Conn., Secretary.

Maine Medical Association, Bar Harbor, June 26-28. Dr. F. R. Carter, 22 Arsenal St., Portland, Secretary.

Medical Library Association, Boston, June 28-30. Miss Janet Doe, 2 East 103d St., New York, Secretary.

Minnesota State Medical Association, Duluth, June 29-July 1. Dr. E. A. Meyerding, 11 West Summit Ave., St. Paul, Secretary.

National Tuberculosis Association, Los Angeles, June 20-23. Dr. Charles J. Hatfield, 7th and Lombard Sts., Philadelphia, Secretary.

West Virginia State Medical Association, White Sulphur Springs, July 11-13. Mr. Joe W. Savage, Public Library Building, Charleston, Executive Secretary.

Wyoming State Medical Society, Laramie, Aug. 7-9. Dr. M. C. Keith, 156 South Center St., Casper, Secretary.

Current Medical Literature

AMERICAN

The Association library lends periodicals to Fellows of the Association and to individual subscribers in continental United States and Canada for a period of three days. Periodicals are available from 1927 to date. Requests for issues of earlier date cannot be filled. Requests should be accompanied by stamps to cover postage (6 cents if one and 12 cents if two periodicals are requested). Periodicals published by the American Medical Association are not available for lending but may be supplied on purchase order. Reprints as a rule are the property of authors and can be obtained for permanent possession only from them.

Titles marked with an asterisk (*) are abstracted below.

American Journal of Cancer, New York

32: 495-654 (April) 1938

Comparative Study of Reducing Substance (So-Called Glutathione) of Blood in Normal, Malignant and Nonmalignant Conditions. A. E. Osterberg, R. J. Coffey, J. A. Bargen and C. F. Dixon, with technical assistance of Elizabeth V. Maclay, Rochester, Minn.—p. 495.

Studies on Exchange of Potassium Between Tumor Cell and Medium. A. Lasnitzki.—p. 513.

*Epidermoid Carcinoma in Osteomyelitis: Case Report. J. H. Harrison, Boston.—p. 527.

Development of Sarcoma in Mice Injected with Hormones or Hormone-like Substances. E. L. Burns, V. Suntzeff and L. Loeb, St. Louis.—p. 534.

Transplantable Uterine Rat Sarcoma of 100 per Cent Transmissibility. J. A. Pollia, Los Angeles.—p. 545.

Sarcoma Formation in an Autologous Graft of Mammary Tissue. A. Fischer, Copenhagen, Denmark.—p. 549.

Respiratory Quotients of Normal and Leukemic Mouse Lymphoid Tissue. J. Victor and J. S. Potter, New York.—p. 554.

Ability of Tumor Tissue to Oxidize the Fatty Acids in Vitro. E. Ciaranfi, Naples, Italy.—p. 561.

Comparative Effect of 200 Kilovolts of X-Rays and Gamma Rays on Pupae of Drosophilia Melanogaster: I. Determination of "Equivalent Roentgen" Value for Gamma Rays: II. Summation Experiments with X-Rays and Gamma Rays. J. H. Muller, New York.—p. 565.

Epidermoid Carcinoma in Osteomyelitis.—Harrison reports a case of chronic (eighteen years) osteomyelitis of the tibia with epidermoid carcinoma in the sinuses extending up the anterior, medial and lateral aspects of the leg, with invasion of the soft tissues and bone. Following amputation up to the midthigh the patient made a striking recovery from an advanced state of general physical debility and cachexia. She is well and without evidence of metastasis two years after operation. When epithelial cells during the process of regeneration are exposed to the products of chronic inflammatory exudate for many years their normal repair is altered to an extent which may eventually result in neoplastic growth. The life history of carcinoma developing in osteomyelitic foci is one of slow progression. In view of the tendency of the tumor to remain localized, a good result may confidently be expected after amputation of the involved limb. Considering the slow growth of the lesion and the failure to metastasize, there may be some doubt as to whether it represents true epidermoid carcinoma. Yet the extensive invasion with replacement of soft tissue and bone must place the neoplasm in that category.

American Journal of Public Health, New York

28: 423-558 (April) 1938

Certain Criteria in Qualifications and Preparation of Health Officers. H. E. Meleney, Nashville, Tenn.—p. 423.

The Physician's Statement of Cause of Death. A. H. Sellers, Toronto, Canada.—p. 430.

Organisms Involved in Pollution of Water from Long-Stored Feces. L. W. Parr, Washington, D. C.—p. 445.

Preventive Aspects of Crippling Diseases. H. E. Hilleboe, St. Paul.—p. 451.

The Public Health Nurse and Orthopedic Nursing Care. Dorothy J. Carter, Boston.—p. 458.

Social Work and the Physically Handicapped Child in the Development of a New State Program. Dorothy Buckner, Augusta, Maine.—p. 464.

Acquired Tuberculosis in Primate in Laboratories and Zoologic Collections. C. R. Schroeder, New York.—p. 469.

Industrial Hygiene Applied to the Clothing Manufacturing Industry. W. H. Schulze, Baltimore.—p. 476.

*Necropsy Evidences on Relation of Smoky Atmosphere to Pneumonia. S. R. Haythorn and H. B. Meller, Pittsburgh.—p. 479.

Physique and Health. J. F. Williams, New York.—p. 487.

Problem of Causes of Stillbirth. Ethel C. Dunham, Elizabeth C. Tandy, E. F. Daily and Clara E. Hayes, Washington, D. C.—p. 491.

Extent and Seasonal Variations of Intermittency in Growth. C. E. Turner and A. Nordstrom, Cambridge, Mass.—p. 499.

Relation of Smoky Atmosphere to Pneumonia.—Pittsburgh presents an unusual opportunity for the study of the relation of smoke to pneumonia. Haythorn and Meller review the evidence accumulated and add to it the data acquired through the analysis of 3,000 persons dying from various diseases in Pittsburgh hospitals. The examinations were made for the purpose of determining the kinds and extent of the changes in the lungs and the amount of visible deposits of dust. The series represents a cross section of the general inhabitants of the city. The lungs removed at necropsy were graded microscopically for the amount of extraneous pigment and the resulting fibrosis. Grades 0, 1 and 2 appeared to have no particular occupational basis. Grade 3 was a mixed nonoccupational and occupational group. Grades 4 and 5 were largely, although not exclusively, occupational. The incidence of pneumonia "all forms" and of lobar pneumonia was tabulated in relation to each grade of anthracosis. In spite of the high local death rate from pneumonia, no anatomic evidences of a relation between the incidence of pneumonia and the milder grades of anthracosis could be demonstrated in the nonoccupational groups. In grades 3, 4 and 5 there was a definitely higher percentage of pneumonia, but the average age for each of these grades coincided with the period of life at which the death rate from pneumonia in less smoky communities is likewise highest. Healing by organization of unresolved pneumonia was consistently higher in all of the more advanced grades of anthracosis and greatest in grade 5. The organizing foci appeared to be associated with heavy deposits of pigment, microscopic areas of fibrosis and isolated emphysematous pockets in fibrosed portions of the lungs. Nothing tangible was found to connect the deposits of pigment with the high incidence of pneumonia and high mortality rates, but the association of severe anthracosis and healing by organization formerly reported is verified.

Annals of Internal Medicine, Lancaster, Pa.

11: 1777-1924 (April) 1938

*Grave Sequelae of Blood Transfusions: Clinical Study of Thirteen Cases Occurring in 3,500 Blood Transfusions. E. L. DeGowin, Iowa City.—p. 1777.

Chronic Atrophic Arthritis. H. E. Thompson, B. L. Wyatt and R. A. Hicks, Tucson, Ariz.—p. 1792.

Tumors of Pulmonary Apexes and Adjacent Regions Involving Brachial Plexus. H. C. Habein, J. M. Miller and J. C. Henthorne, Rochester, Minn.—p. 1806.

Circulation Time as Diagnostic Aid in Hyperthyroidism. S. J. Goldberg, Philadelphia.—p. 1818.

*Therapeutic Experiences with Cobra Venom. D. I. Macht, Baltimore.—p. 1824.

Gastric Secretion in Cases of Pernicious Anemia. H. M. Rozendaal, Schenectady, N. Y., and R. N. Washburn, Rochester, Minn.—p. 1834.

*Urticaria: A New Therapeutic Approach. H. A. Rusk and B. D. Kenamore, St. Louis.—p. 1838.

Upper Lobe Pneumonia in the Adult. M. B. Rosenblatt and A. Bachman, New York.—p. 1845.

Heliotherapy of Tuberculosis. E. Mayer, New York.—p. 1856.

The Syndrome of Extrarenal Azotemia. H. Jeghers and H. J. Bakst, Boston.—p. 1861.

Grave Sequelae of Blood Transfusions.—DeGowin states that from November 1933 to July 1937 approximately 3,500 blood transfusions were performed in the hospitals of the University of Iowa. Citrated blood was used almost exclusively. It was administered through small needles by gravity. All serious complications resulting from transfusion were studied as thoroughly as circumstances permitted. Most of the transfusions were given with bloods of the same group, although bloods of group O were used occasionally when the homologous group was not available. Seven deaths directly attributable to blood transfusions occurred. Five persons died of renal insufficiency and two of pulmonary edema. Only one person in whom renal insufficiency developed recovered. The importance of using typing serums of high titer is emphasized by the donor in cases 2 and 4, who gave blood as of group O and later, with stronger serums, was found to belong to group A. The necessity for cross matching of bloods in addition to typing is illustrated by two cases in which the recipients were

found to belong to atypical blood groups which were not differentiated by strong typing serums and in which errors apparently occurred in the preliminary cross matching. A transfusion should be discontinued immediately on the occurrence of any unusual symptoms. That the present laboratory tests as routinely applied involving cross matching by the hanging drop, the Vincent open slide and the Landsteiner centrifuge methods are inadequate in certain instances to detect incompatibilities of bloods which after transfusion become manifest clinically is illustrated by one case and the experience of other authors. The various theories to account for the mechanism of renal insufficiency from blood transfusion are discussed. In view of the present ignorance of the mechanism of renal damage it would seem that the only safe procedure at present is to alkalize the urine prior to transfusion. The use of "universal donors" is fraught with danger unless the agglutinins of the donor have been previously titrated and found to be weak. Pulmonary edema from blood transfusion is not the result of the administration of incompatible blood. On theoretic grounds, it would seem to be due to overburdening of the right side of the heart. Patients with cardiac damage and those with nitrogen retention from any cause apparently tolerate transfusions poorly. In patients having diseases which predispose to retinal hemorrhage transfusion is sometimes followed by bleeding into the macular region, causing serious impairment of vision. Necropsies of patients receiving transfusions are occasionally highly instructive if the pathologist is familiar with the morbid anatomy of transfusion reactions. This is especially true in cases of renal insufficiency.

Therapeutic Experiences with Cobra Venom.—The conclusion that Macht draws from various experiments is that cobra venom, like opium and its principal alkaloid, morphine, relieves pain through its action on the higher centers of the brain. While morphine relieves pain promptly and the effect wears off within a few hours, cobra venom does not induce analgesia rapidly but once it is induced the analgesia lasts much longer than that of morphine. Once analgesia has been established, patients may usually be kept comfortable with two or three weekly intramuscular injections of 5 mouse units of cobra venom. The author has personally administered two such injections twice a week to patients with advanced and hopelessly malignant cancers for months in succession and he has been able to keep them comfortable without using any other drug. While cobra venom has been chiefly advocated in cases of hopelessly advanced malignant tumors and their metastases, during the past year or two the author has extended its use to the treatment of certain nonmalignant conditions (severe neuralgias, chronic arthritis and angina pectoris with subacute, long-lasting paroxysms of pain). The number of arthritic cases treated with this drug is still not large enough to warrant discussion, although considerable relief of pain has been obtained in some instances. Cobra venom has also relieved the pain and relaxed the rigidity of the muscles and produced a general amelioration of parkinsonian symptoms in seven cases. The action of the drug in such cases is probably a complex one: (1) The analgesic action of cobra venom certainly plays a part, (2) the anticonvulsant property of the drug may also exert an effect and (3) it is probable that certain peripheral effects of cobra venom described by Cicardo may be involved in the mechanism of its action.

Urticaria.—It seems logical to Rusk and Kenamore that potassium should be a valuable drug in the treatment of edematous lesions of the skin: first it lowers the cutaneous irritability directly and secondly its pharmacologic reaction is similar to and definitely allied with epinephrine. The results in six cases that they report are far from conclusive but definitely indicate the therapeutic response. These patients had been tried on the various allergic regimens and orthodox treatment without success. A sound physiologic and pharmacologic basis seems to exist for the treatment of the various allergic phenomena by further change in the already abnormally altered mineral balance. In cutaneous irritability and cutaneous inflammation the potassium metabolism is markedly altered and an increase in cutaneous potassium causes an appreciable decrease in localized irritability. Potassium is almost identically like epinephrine in its pharmacologic action. Because of these known facts it seems logical that certain allergic problems could be approached from this therapeutic angle with benefit. A high protein, low sodium, acid-ash diet, with added potassium chloride, has produced promising clinical results in six cases of chronic urticaria.

Archives of Pathology, Chicago

25: 607-776 (May) 1938

Postmortem Examination of Stillborn and of Newly Born Infants. Edith L. Potter Chicago.—p. 607.

Experimental Atherosclerosis: I. Effect of Prolonged Administration of Thyrotropic Factor of Anterior Lobe of Pituitary on Experimental Atherosclerosis in Rabbits. M. Bruger and F. Fitz, New York.—p. 637.

*Comparative Bacteriologic Studies of Human Blood, Viscera and Teeth Obtained at Necropsies. C. G. Burn and L. W. Burket, New Haven, Conn.—p. 643.

*Effect of Carbon Dioxide on Clotting of Blood. J. Tannenberg, Albany, N. Y.—p. 652.

Experimental Investigation of Lechuguilla Poisoning. F. P. Mathews, Alpine, Texas.—p. 661.

Lymphocytic Response of Guinea Pigs to Epinephrine Hydrochloride, Sodium Bicarbonate Solution and Culture of Bacillus Coli, with Particular Reference to Effect of Antineutrophilic Serum on Lymphocytic Curves. J. S. Lawrence and W. B. Chew, Rochester, N. Y.—p. 684.

Role of Vitamin B in Resistance: VIII. Effect of Diets Rich in Vitamin B on Natural Resistance of Animals to Experimental Infection. D. Perla, New York.—p. 694.

Postmortem Bacteriology.—Burn and Burket find that cultures of human cardiac blood, viscera and apical tissues of the teeth obtained at necropsies show no significant differences in the frequency of recovery of bacteria from these sites. The greatest difference occurred in the kinds of organisms obtained. Streptococcus viridans and Streptococcus nonhaemolyticus were predominant among the bacteria recovered from the tissues around the apexes of the teeth. Other kinds were obtained with greater frequency from the blood stream and viscera. Staphylococci were procured from both teeth and viscera, in about the same frequency. Only eleven (10 per cent) of the apexes isolated in seven of thirty-eight necropsies on persons with bacteremia had gingival tissue and crowns sufficiently well preserved to suggest that the organisms at the apexes were from the blood stream. Bacillus coli was found around the teeth only in the presence of bacteremia. Streptococcus haemolyticus, Diplococcus pneumoniae and three unidentified organisms were the other kinds recovered from both blood and teeth. Of the fifty-five necropsies on persons with negative blood cultures obtained clinically or after death, eight showed fifteen apexes containing Streptococcus haemolyticus or pneumococci. The infections of three of these apexes are known to have been due to invasion by bacteria from the oral cavity. Suggestive evidence that transient bacteremia might occur at times during the life of a subject is indicated in the postmortem isolation of pathogenic organisms from the viscera, although both the clinical and the postmortem blood cultures remained negative.

Effect of Carbon Dioxide on Clotting.—Tannenberg studied the influence of carbon dioxide on the clotting of blood. Whole blood obtained from various veins and arteries was studied directly after its removal in an apparatus whereby saturation with carbon dioxide was rapidly secured without mechanical disturbance of the blood by the gas. Citrated and recalcified blood and plasma were studied systematically directly after removal and after various periods up to five days. Citrated blood, the gases of which were evacuated in vacuo and which was subsequently saturated with carbon dioxide or oxygen, was also studied. In all these samples, carbon dioxide produced a varying but definite delay of clotting without, however, preventing it. Accordingly, the spontaneous clotting of blood in the heart and large veins of rabbits put to death following periods of inhalation of carbon dioxide was delayed. Acceleration of clotting after short periods of inhalation of carbon dioxide is considered an indirect transient effect of carbon dioxide on the peripheral and central nervous system, producing an enlarged output of epinephrine. Carbon dioxide is considered one metabolic product which physiologically counteracts clotting and thrombosis, especially in the small veins of the liver and kidney. Carbon dioxide may also be largely responsible for

the fact that blood in the capillaries is found liquid after death. This fact had heretofore been ascribed to the influence of the capillary endothelium, for which theory reasonable evidence was never adduced.

Arkansas Medical Society Journal, Fort Smith

34: 259-282 (May) 1938

The Irritable Heart and Its Accompaniments. T. J. Dry, Rochester, Minn.—p. 259.
Bacillary Dysentery in 1937, Flexner in Type. L. D. Massey and Hortense Loucks, Osceola.—p. 266.
Infections of the Hand. H. E. Mobley, Morrilton.—p. 269.
Intussusception: Case Report. J. J. Monfort, Batesville.—p. 271.

California and Western Medicine, San Francisco

48: 305-392 (May) 1938

*Selective Collapse by Partial Thoracoplasty: Recent Advances in Surgical Treatment of Pulmonary Tuberculosis. E. Holman and P. Pierson, San Francisco.—p. 312.
Abdominal Hernias: Use of Autogenous Strips of Fascia Lata in Repair of More Difficult Abdominal Hernias. D. C. Collins, Los Angeles.—p. 317.
Tonsillectomy: Planned, Complete Operation. W. R. Hunt, Santa Barbara.—p. 322.
Drug Eruptions Due to Barbiturates. F. G. Novy Jr., Oakland.—p. 324.
Acute Gonorrheal Arthritis Complicating Pregnancy. J. R. Upton, San Francisco.—p. 326.
Thrombocytopenic Purpura Haemorrhagica: Blood Studies During Infections After Splenectomy for Thrombocytopenic Purpura Haemorrhagica (Infectious Origin). K. H. Abbott, Ontario.—p. 332.
Id.: Treatment with Massive Doses of Moccasin Snake Venom. C. P. Imerman and S. W. Imerman, Los Angeles.—p. 335.
Endocrine Therapy in Acne Vulgaris. H. J. Templeton and S. R. Truman, Oakland.—p. 337.
Rotating Anode X-Ray Tube. R. A. Powers, Palo Alto.—p. 339.
Reconstruction of the Enlarged Breast. H. O. Bames, Los Angeles.—p. 341.
Simmonds' Disease (Hypophysial Cachexia): Clinical Report of Several Cases with Discussion of Diagnosis and Treatment. R. F. Escamilla and H. Lisser, San Francisco.—p. 343.
Monocytic Leukemia: Some Blood and Bone Marrow Studies. H. A. Wyckoff, San Francisco.—p. 348.

Selective Collapse by Partial Thoracoplasty.—Pulmonary tuberculosis is frequently characterized by a large apical abscess, which forms the most intractable focus of the disease. Such an abscess must be closed either by reexpansion of the good lung or by compression. Healing will not occur unless closure of the cavity is effected. For such an abscess Holman and Pierson believe that localized selective collapse is preferable to the usual complete paravertebral thoracoplasty. A limited thoracoplasty may be necessary because of bilateral involvement of the lungs or the necessity for conserving the good lung at the base. The abscess may be displaced rather than compressed by the old fashioned paravertebral procedure. Complete collapse of apical abscesses may be aided by complete resection of the upper three ribs from the transverse process in the back to the costal cartilage in the front, resection of the transverse processes over the site of the abscess and resection of the lower third of the scapula. Revision of inadequate thoracoplasties for incompletely collapsed cavities should not be a repetition of previously ineffectual procedures but should include resection of the transverse processes over the site of the abscess and, when necessary, resection of the anterior stumps of the ribs through an anterior incision. In the presence of bilateral apical abscesses, a unilateral upper thoracoplasty may be effective in relaxing the opposite apex, thus providing better conditions for healing of both abscesses by one operative procedure. Thoracoplasty as a therapeutic measure should not be condemned or abandoned until the offending cavity has been effectually and completely collapsed.

Connecticut State Medical Society Journal, Hartford

2: 207-256 (May) 1938

Regional Enteritis: Report of Two Cases. B. B. Landry, Hartford.—p. 213.
A Short Talk on Medical Libraries. A. Malloch, New York.—p. 223.
Treatment of Late Syphilis. M. J. Strauss, New Haven.—p. 227.
*Treatment of Alcoholic Psychoses with Thiamin Chloride (Synthetic Crystalline Vitamin B). M. E. Brodsky, Bridgeport.—p. 228.
The Hernia Problem. D. H. M. Gillespie, New York.—p. 231.

Treatment of Alcoholic Psychoses with Thiamin Chloride.—Up until 1937, when vitamin B extract became available in large quantities, alcoholic psychoses were a serious and unmanageable problem. Since that time it has been possible to treat such conditions with a great deal of success. Of thirty-six cases that Brodsky treated, thirty-five are apparently cured. It is too early as yet to state definitely whether the cure will be permanent. All the chronic alcoholic psychoses treated were based on a history of alcoholism over a considerable period with hallucinations, particularly of the auditory threatening type, fear and disorientation. The treatment was as follows: (1) the removal if possible of alcohol, (2) daily injections of massive doses of crystalline vitamin B in the gluteal muscle, the dosage being anywhere from 500 to 2,000 units daily and (3) the administration of some such sedative as bromide, chloral and, in some cases, phenobarbital. Prompt improvement was observed in all cases within a period of weeks or months and an absolute cessation of all symptoms even though they had lasted for some time. There was no recurrence of a desire for alcohol. This peculiarity was noticed also in acute alcoholic psychoses. The acute psychoses were treated with spinal drainage and daily hypodermic injections of vitamin B into the gluteal muscles in small doses such as from 300 to 500 units, and these also showed an improvement and a lack of desire to return to the former habits. The author is at present conducting a series of experiments to determine whether the human brain contains vitamin B normally and whether it is destroyed by alcohol.

Delaware State Medical Journal, Wilmington

10: 51-68 (April) 1938

Danger of Preoperative Delay in Suspected Brain Tumor Cases. F. H. Leavitt, Philadelphia.—p. 51.
Injection of Sterilized Oil into Joints for Diagnostic Purposes. P. N. Jepson, Philadelphia.—p. 59.

Georgia Medical Association Journal, Atlanta

27: 133-176 (April) 1938

Acute Infectious Diseases of the Nervous System. R. B. Wilson, Atlanta.—p. 133.
Injection Treatment of Hernia. E. Callaway, LaGrange.—p. 139.
The Practical Applications of Human Blood Typing Tests. E. B. Saye, Macon.—p. 143.
Low Back Pain with Sciatic Radiation: Recent Advances in Treatment. M. Harbin, Cleveland.—p. 147.
Tumors of the Bladder: Benign and Malignant. E. G. Ballenger, O. F. Elder, H. P. McDonald and R. C. Coleman Jr., Atlanta.—p. 153.
Staphylococcic Septicemia: Treatment with Bacteriophage. W. M. Gilbert, Rome.—p. 155.
The Family Doctor versus Federal Medicine Socialized. J. C. Orr, Buford.—p. 158.

Illinois Medical Journal, Chicago

73: 357-448 (May) 1938

Interstitial Keratitis Treated with Zinc Ionization: Preliminary Report. S. M. Edison, Chicago.—p. 405.
Surgical Emphysema of the Head and Neck Following Tonsillectomy. S. Del Chicca, Chicago.—p. 414.
Technic of Lumbar Puncture. A. Gabrielianz, Chicago.—p. 415.
*Phrenic Interruption in Treatment of Pulmonary Tuberculosis. B. Klein, Joliet.—p. 418.
Fever in Children. E. Prilla, Chicago.—p. 420.
Treatment of Pneumonias with Sulfanilamide. D. J. Louis, Chicago.—p. 422.
Agranulocytosis Following Use of Sulfanilamide: Report of Case. P. R. McGuire and J. P. McGuire, Chicago.—p. 425.
The Birthright of a Child. N. Genevieve Chipman, Savanna.—p. 427.
Present Day Problems in Mentally Deficient Children. J. C. Krafft, Chicago.—p. 428.
Use of Mandelic Acid in Treatment of Genito-Urinary Infections. J. W. Ferrin, Chicago.—p. 429.
Place of Vaginal Cesarean Section in Obstetrics, with Presentation of Thirty-Four Cases. C. Fournarakis, Chicago.—p. 433.
Proctitis. C. J. Drueck, Chicago.—p. 438.

Phrenic Interruption in Pulmonary Tuberculosis.—Klein lists the uses of phrenic operations. The object of phrenic interruption is to paralyze the hemidiaphragm. Besides functional rest, phrenic interruption also produces a varying degree of venous and lymphatic stasis, as well as anoxemia, which plays such an important part in promoting fibrosis and encapsulation of tuberculous lesions with diminution of septic absorption from the lung. Phrenic interruption can be brought about by radical phrenicotomy, or exeresis, by simple phrenicotomy and by crushing the nerve fibers. In a series of seventy-five cases in which phrenic interruption was done by the author, forty-five were classified as moderately advanced and thirty belonged to the far advanced group. All but five cases showed

some improvement of subjective symptoms within three months following phrenic interruption. Of the total number of patients fifty-four became definitely improved, as evidenced by closure of the cavity and negative sputum. Of the remaining twenty-one patients all were known to have thick walled cavities, and supplementary operations, such as thoracoplasty, pneumothorax and permanent phrenic interruption, were performed on fifteen patients. Of these six died from extension of the tuberculous process and not as a direct result of the operation. The increased use of temporary phrenic paralysis has considerably widened the scope of its usefulness in the treatment of pulmonary tuberculosis. Having the added advantage of permitting with impunity a subsequent change from a temporary to a permanent paralysis or to supplement it with pneumothorax, temporary phrenic paralysis should be seriously considered when contemplating the first step in collapse therapy.

Indiana State Medical Assn. Journal, Indianapolis

31: 219-274 (May) 1938

Fetal and Neonatal Loss. C. O. McCormick, Indianapolis.—p. 219.
Incidence and Mortality of Cesarean Section. K. M. Beierlein, Fort Wayne.—p. 228.
Some Surgical Principles in Treatment of Infections of the Hand. S. L. Koch, Chicago.—p. 231.
Renal Function Tests in Medical Practice. A. C. Corcoran, Indianapolis.—p. 233.
Appraisal of Visual Defects of Children in Indiana. G. A. Peters, Indianapolis.—p. 237.

Iowa State Medical Society Journal, Des Moines

28: 169-216 (May) 1938

Hemolytic Streptococcus Sore Throats of Milk-Borne Origin: Epidemiologic Observations. T. E. Eyres, Des Moines.—p. 169.
Milk-Borne Streptococcic Sore Throats: Clinical Observations. F. Sternagel, West Des Moines.—p. 173.
Some Aspects of Fever Therapy. W. D. Paul, Iowa City.—p. 176.
Modern Treatment of Urinary Infections. P. F. Olson, Dubuque.—p. 180.
Extreme Azotemia of Unknown Origin and Without Uremia: Case Report. A. E. Feller and J. A. Greene, Iowa City.—p. 184.
Practical Aspects of Diabetes Mellitus with an Evaluation of Protamine Zinc Insulin. M. J. Rotkow, Des Moines.—p. 187.
Orthopedic Diagnosis of Chronic Low Back Pain. L. M. Overton, Des Moines.—p. 191.

Johns Hopkins Hospital Bulletin, Baltimore

62: 235-474 (April) 1938

John Shaw Billings as an Army Medical Officer: A Tribute on His Hundredth Birthday, April 12, 1938. E. E. Hume, Washington, D. C.—p. 237.
John Shaw Billings and the Johns Hopkins Medical School: Tribute on One Hundredth Anniversary of His Birth. A. M. Chesney, Baltimore.—p. 283.
Two Papers by John Shaw Billings on Medical Education. A. M. Chesney, Baltimore.—p. 297.
John Shaw Billings and the History of Medicine. S. V. Larkey, Baltimore.—p. 372.
John Shaw Billings and the New York Public Library. H. M. Lydenberg, New York.—p. 389.
*Regional Ileitis and Ulcerative Colitis. E. S. Stafford, Baltimore.—p. 399.
Action of Insulin on Glycogen Reserves. E. M. Bridge, Baltimore.—p. 408.
Low Grade Partial Obstruction of Small Intestine. L. Martin and H. E. Wright, Baltimore.—p. 422.
Studies on Immunizing Substances in Pneumococci: VI. Essential Immunizing Antigens of Types I and II Pneumococci. L. D. Felton and Gladys Kauffmann, Baltimore.—p. 430.
Congenital Universal Insensitiveness to Pain: Clinical Report of Three Cases in Children with Discussion of Literature. F. R. Ford and L. Wilkins, Baltimore.—p. 448.

Regional Ileitis and Ulcerative Colitis.—Stafford compares the etiologic aspects of regional ileitis with those of three cases of ulcerative colitis with lymphogranuloma of the large intestine. The clinical history in each case is not unlike that of a case of regional ileitis, the chief differential point being the presence of a positive Frei test. Under the microscope, in the last of these three, the typical lymphogranulomatous lesion is present and easily differentiated from the nonspecific lesion of regional ileitis. The microscopic appearance of the lesions in the first two cases of lymphogranuloma is not strikingly different from that of regional ileitis. In no case of regional ileitis were any tubercle-like structures found. The presence of a small foreign body in the third case cited is no doubt secondary to ulceration of the mucosa. In lymphogranuloma intestinal lesions may occur anywhere in the large intestine. No case has been observed in the Johns Hopkins Hospital, however, in which ulceration due to lymphogranuloma has been found in the small intestine. In the present series of ten cases of regional ileitis the Frei test, when carried out, was negative. The intestinal lesions due to the virus of lymphogranuloma are confined to the large intestine, whereas in regional ileitis the lesions are located in the small intestine. Many cases have recently been reported in which lesions were found simultaneously in the small and large intestines. These should be reconsidered, in the light of the possibility of discovering lymphogranuloma. The clinical features in the two types of cases are similar. The many points of similarity in the clinical course and, to a lesser extent, in the pathologic picture between lymphogranuloma of the intestine and regional ileitis suggest that the lesions of the latter are also produced by a virus infection. Further work with material from regional ileitis must be done to settle this point. Tuberculosis and amebiasis have both been adequately disposed of as possible etiologic factors by earlier writers on this subject.

Journal of Experimental Medicine, New York

67: 659-826 (May) 1938

Hydrogen Ion Concentration in Exudates of Pneumococcic Infection. W. H. Kelley, E. N. Scadron and B. M. Shinners, Durham, N. C.—p. 659.
Effects of Acidity on Growth of Pneumococcus in Culture Mediums Containing Proteins. W. H. Kelley, Durham, N. C.—p. 667.
Blood Plasma Protein Regeneration as Influenced by Fasting, Infection and Diet Factors: Variable Reserve Stores of Plasma Protein Building Material in the Dog. S. C. Madden, W. E. George, G. S. Waraich and G. H. Whipple, Rochester, N. Y.—p. 675.
Uterine Adenomas in the Rabbit: I. Clinical History, Pathology and Preliminary Transplantation Experiments. H. S. N. Greene and J. A. Saxton Jr., Princeton, N. J.—p. 691.
Cross Reactions of Immune Serums to Azoproteins: II. Antigens with Azocomponents Containing Two Determinant Groups. K. Landsteiner and J. van der Scheer, New York.—p. 709.
Statistical Studies of Nature of Infectious Unit of Vaccine Virus. R. F. Parker, Cleveland.—p. 725.
*Serologic Evidence for Occurrence of Infection with Human Influenza Virus in Swine. R. E. Shope, Princeton, N. J.—p. 739.
Excretion of Cyanol, Azofuchsin I and Water by Kidneys of Rabbits. W. E. Ehrich, G. M. Bartol and R. E. Wolf, Philadelphia.—p. 749.
Acute Experimental Glomerular Nephritis in Rabbits: Correlation of Morphologic and Functional Changes. W. E. Ehrich, R. E. Wolf and G. M. Bartol, Philadelphia.—p. 769.
Effect of Tissue Enzyme on Pneumococci. R. J. Dubos and C. M. MacLeod, New York.—p. 791.
Immunization of Experimental Animals with Soluble Antigen Extracted from Pneumococci. R. J. Dubos, New York.—p. 799.
Studies on Experimental Hypertension: VII. Production of Malignant Phase of Hypertension. H. Goldblatt, Cleveland.—p. 809.

Human Influenza Virus in Swine.—Shope studied the serums from two age groups of swine on two New Jersey institution farms for their capacity to neutralize the swine and human influenza viruses. The serums from none of the young swine, born since July 1937, neutralized either virus. However, the serums of all the old hogs studied on one farm and three fourths of those on the other farm neutralized human influenza virus, although failing to neutralize swine influenza virus. These older animals had all been born prior to November 1936 and had thus lived through a winter when human influenza was known to have been unusually prevalent. The presence of human influenza virus-neutralizing antibodies in the serums of the older animals was not an age phenomenon, because serums from swine of corresponding ages from other sources failed to neutralize human influenza virus. It is believed that the antibodies in the serums of the older animals resulted from actual infection with human influenza virus and that a widespread infection of human origin had occurred. The failure to recognize either outbreak is not surprising because, even under conditions of experimental infection of swine with large doses of human influenza virus alone, the resulting disease is so mild and ill defined as to be difficult of certain recognition. How the virus was transferred to swine is unknown, though presumably it was either by direct exposure to human cases or through the medium of garbage contaminated by virus. The antigenic compositions of the influenza viruses infecting the swine at Bordentown and Jamesburg were definitely and completely different from that of ordinary swine influenza virus.

Previous to the experiments just described there has been no concrete evidence that influenza virus could be transmitted from man to swine under natural conditions. The present experiments, by demonstrating that human influenza virus of the type prevalent during the winter of 1936-1937 was transmitted to swine under natural conditions, furnish evidence that a similar transmission from man to swine might readily have occurred in 1918.

Journal of Infectious Diseases, Chicago

62: 129-224 (March-April) 1938

Attenuation and Toxin Production of Diphtheria Bacillus: VI. Ultrafiltration of Toxin Produced in Peptone-Dialysate Mediums. A. Wadsworth, Mary W. Wheeler and Laura Mendez, Albany, N. Y.—p. 129.
Linkage of Phage-Induced Characters in Eberthella Typhi. Jeanette D. Taranik and Jane E. Snow, Stanford University, Calif.—p. 131.
Variation in Hemolytic Streptococci. M. H. Dawson, G. L. Hobby and Miriam Olmstead, New York.—p. 138.
Comparison of Bacterium Necrophorum from Ulcerative Colitis in Man with Strains Isolated from Animals. G. M. Dack, L. R. Dragstedt, R. Johnson and N. B. McCullough, Chicago.—p. 169.
Studies of Anaerobic Streptococci from Pulmonary Abscesses. C. Weiss and Dora G. Mercado, San Francisco.—p. 181.
Hemolytic Streptococci of Human Feces. F. R. Smith and J. M. Sherman, Ithaca, N. Y.—p. 186.
Hemolytic Streptococci of Milk. J. M. Sherman and C. F. Niven, Ithaca, N. Y.—p. 190.
Studies on Bacterial Nutrition: Possible Role of Inorganic Salts and of Alterations in Culture Medium in Providing Growth-Promoting Effects. S. A. Koser, R. D. Finkle, A. Dorfman and F. Saunders, Chicago.—p. 202.
Id.: Comparative Study of Growth-Promoting Properties of Various Substances. S. A. Koser, R. D. Finkle, A. Dorfman, Mary V. Gordon and F. Saunders, Chicago.—p. 209.
Attempts to Assay Enterotoxic Substance Produced by Staphylococci by Parenteral Injection of Monkeys and Kittens. Ellen Davison, G. M. Dack and W. E. Cary, Chicago.—p. 219.

Journal-Lancet, Minneapolis

58: 207-264 (May) 1938

Brain Tumors in Children. A. W. Adson, Rochester, Minn.—p. 207.
Cryptorchidism. R. L. Wilder, Minneapolis.—p. 216.
Fundamentals of Nutrition. L. S. Palmer, St. Paul.—p. 219.
*Acute Anterior Poliomyelitis. W. S. Sako, R. L. Wilder and A. V. Stoesser, Minneapolis.—p. 223.
Field Clinics for Crippled Children in Minnesota. H. E. Hilleboe, St. Paul.—p. 231.
Early Treatment of Chemical Burns of the Esophagus: One Case Report of Advanced Stricture with Unusual Complications. K. A. Phelps, Minneapolis.—p. 237.
The Feeding of the Child. C. A. Stewart, Minneapolis.—p. 239.
Interesting Pediatric Cases Seen in Rural Practice. G. T. Schimelpfenig and M. B. Hebeisen, Chaska, Minn.—p. 244.
Prostatitis. R. G. Hassett, Mankato, Minn.—p. 245.
College Mental Hygiene Methods: II. One Year's Experience with Scheme for Early Detection of Personality Disorders Among Students. E. O. Harper, Cleveland, and H. D. Palmer, Philadelphia.—p. 250.

Acute Anterior Poliomyelitis.—Sako and his associates review the sixty-eight cases of acute anterior poliomyelitis admitted to the University and Minneapolis General Hospitals from July 1, 1937, to Dec. 31, 1937. In all these cases the diagnosis of acute anterior poliomyelitis was made after careful clinical and thorough laboratory investigation. The sex distribution was equal in the series. No evidence has been found to show any correlation between the blood groups and the incidence of poliomyelitis or the severity of paralysis. Paralysis of the muscles of the trunk and abdomen was frequent. Careful muscular tests should therefore be done before the patient is discharged in order to prevent subsequent deformities. The leukocyte count showed no relation to the temperature, the average count being at the upper limit of normal. This suggests that the blood response and presumably the antibody response is slow or absent. The majority of the spinal fluid cell counts were between 50 and 100. The curve of the spinal fluid cell count gradually fell until the onset of paralysis, when it rose again and then gradually fell. The polymorphonuclear count gradually decreased as the disease progressed, and the mononuclears correspondingly gradually rose until about the fourteenth day, when they reached practically 100 per cent. Repeated spinal punctures have revealed that many patients with definite clinical meningeal involvement or even paralysis may have normal spinal cell counts which subsequently may or may not become elevated. The course of the disease cannot be predicted by the temperature, spinal fluid observations or the erythrocyte count. Convalescent human serum administered in the preparalytic stage was not effective in preventing paralysis nor did it cause any improvement in the paralytic cases so treated. Results tend to indicate that normal adult serum is the treatment of choice at the present time. Sulfanilamide administered in large doses to seventeen patients was found to be of no help. The use of respirators should be given preference in intercostal or diaphragmatic paralysis in which this form of treatment is most effective. In bulbospinal cases with unilateral pharyngeal paralysis the patient may be saved if the paralysis does not progress. In pure bulbar cases, the respirator is not indicated and possibly is contraindicated.

Journal of Pharmacology & Exper. Therap., Baltimore

62: 363-484 (April) 1938

Pharmacologic Action of Deuterium Oxide: VI. Its Influence on Insensible Water Loss. H. G. Barbour and Lillie E. Rice, New Haven, Conn.—p. 363.
Sobisminol: Toxicity, Tolerance and Irritation According to Different Channels of Administration. P. J. Hanzlik, A. J. Lehman and A. P. Richardson, San Francisco.—p. 372.
Continued Voluntary Drinking of Sobisminol: General Effects. P. J. Hanzlik and A. J. Lehman, San Francisco.—p. 389.
*Excretion of Bismuth After Intramuscular Injection of Sobisminol: Experimental and Clinical Results. P. J. Hanzlik, A. J. Lehman and A. P. Richardson, San Francisco.—p. 404.
Intramuscular Injection of Sobisminol: Absorption and Distribution of Bismuth. P. J. Hanzlik, A. J. Lehman and A. P. Richardson, San Francisco.—p. 413.
Effects of Prostigmine and Atropine on Human Stomach. H. O. Veach, B. R. Lauer and A. G. James, Columbus, Ohio.—p. 422.
Basis for Acetylcholine Action of Choline Derivatives. R. R. Renshaw, D. Green and M. Ziff, New York.—p. 430.
Action of Acetyl-Beta-Methylcholine Chloride (Mecholyl) in Neurogenic Disturbances of Urinary Bladder, with Note on Mechanism of Spinal Shock. P. M. Levin, Baltimore.—p. 449.
Influence of Ouabain on Contraction of Striated Muscle. M. Cattell, New York.—p. 459.
Relation of Acetanilid and Other Drugs to Analgesia in Monkeys. P. K. Smith, New Haven, Conn.—p. 467.

Excretion of Bismuth After Injection.—The urinary and fecal excretion of bismuth after intramuscular injection of sodium bismuthate soluble (sobisminol) in therapeutic doses in animals and patients was observed by Hanzlik and his collaborators to be similar to that of water-soluble products of bismuth in general. Daily fluctuations in urinary excretion of bismuth were smaller after small doses than after multiple doses of sodium bismuthate soluble; peak of excretion occurred generally on the second or third day after the last injection and the excretion was well sustained, lasting at least one month after from three to twelve doses of sodium bismuthate soluble. Daily fecal excretion of bismuth fluctuated considerably. It amounted to about one eighth or one tenth of the urinary excretion. Sometimes it outlasted the urinary excretion and tended to last longer than after other soluble bismuth products. From 60 to 70 per cent of injected sodium bismuthate soluble was left unaccounted for in the bodies of both animals and patients. This body bismuth is presumably excreted in minute traces over long periods—a desirable state for efficient antisyphilitic treatment. Consistent with an accumulation of bismuth in the body was a comparatively long duration of bismuth excretion and late presence of bismuth in some bloods and cerebrospinal fluids. The solution was satisfactorily tolerated intramuscularly in both animals and man.

New England Journal of Medicine, Boston

218: 663-710 (April 21) 1938

*Etiology of Lung Abscess: Clinical Analysis of 447 Cases Occurring at Boston City Hospital from 1926 to 1935, Inclusive. L. M. Freedman, Boston.—p. 663.
Lung Abscess and Its Relation to Surgery of Upper Respiratory Tract. H. Morrison, Boston.—p. 669.
The General Practitioner and Thoracic Surgery. W. E. Burnett, Philadelphia.—p. 670.
Classification and Treatment of Arthritis. D. S. O'Connor, New Haven, Conn.—p. 677.

Etiology of Lung Abscess.—Freedman selected a total of 447 cases in which the diagnosis of abscess of the lung was made at one time and all proved cases of abscess of the lung for comparative study. Roentgenograms were examined and histories and necropsies were studied. The total of cases accepted for investigation was 276. These were then separated into those of postoperative origin and those with other causes;

196 cases were of medical origin, seventy-six occurred as a postoperative complication and four were a result of trauma. Although it has become the general belief that postoperative complications are predominating factors, this was not the fact in the present cases. A careful investigation in other large clinics should produce similar results. Tonsillectomy is a prominent cause in a large number of cases, largely because it is more frequently performed than any other operation. However, when compared to the total number of operations performed it represents a smaller percentage than is generally realized and compares favorably not only with the incidence following pneumonia but also with that following other postoperative conditions. Nearly all the cases of abscess of the lung after tonsillectomy occur in adult patients, indicating that these patients require more careful selection and preoperative care and better postoperative attention than heretofore recognized. A more careful examination before all operative procedures and more careful postoperative observation will considerably lessen the incidence of postoperative abscess of the lung. A large proportion of abscesses of the lungs are still due to acute and chronic pneumonic processes and in all probability outnumber those occurring as postoperative complications.

New Jersey Medical Society Journal, Trenton

35: 193-258 (April) 1938

The Management of Ureteral Calculus. S. R. Woodruff, Jersey City.—p. 197.
Contract Practice. S. T. Snedecor, Hackensack.—p. 202.
*Ulcerative Enterocolitis in Tuberculosis. E. Granet and G. G. Ornstein, New York.—p. 206.
Subdiaphragmatic Abscess. W. W. Maver and C. Oderr, Jersey City.—p. 209.
Oropharyngeal Insufflation of Oxygen: Technic for Therapeutic Use. E. A. Rovenstine, New York.—p. 213.
The Coutard Technic of External Radiation. M. Friedman, Newark.—p. 216.
The Need of Coordinated Efforts in Combating Cancer. W. G. Herrman, Asbury Park.—p. 220.
Pneumonia Treatment. H. A. Reimann, Philadelphia.—p. 223.
Peripheral Arterial Disease: Fundamentals in Their Diagnosis and Treatment. S. S. Samuels, New York.—p. 224.
Discussion of Maternal Mortality: Maternal Welfare Article Number Twenty-Five. F. C. Holden, New York.—p. 225.

Ulcerative Enterocolitis in Tuberculosis.—Granet and Ornstein made 2,416 examinations on 2,088 patients with pulmonary tuberculosis for the presence of ulcerative enteritis, of which 800 presented definite evidence of enterocolitis. Of patients with positive x-ray evidence of ulcerative enteritis, only 29 per cent had subjective gastrointestinal symptoms. In patients with pulmonary tuberculosis with positive sputum, it is futile to wait for the development or gastrointestinal symptoms in order to establish the diagnosis of complicating ulcerative enterocolitis. A simple barium sulfate examination at seven hours is practical and accurate. A favorable result can be expected from early diagnosis and prompt treatment. Successful treatment of intestinal tuberculosis depends on inactivation of the source of infection in the lungs. Absorption of toxins from active lesions of the lung, by their noxious systemic effect, prevents healing of intestinal lesions. The treatment of the intestinal lesions is general and specific. The general measures include actinotherapy, a high caloric, low roughage diet, the administration of vitamins C and D, iron for secondary anemia, calcium salts and, when indicated, insulin to stimulate appetite. Specific local treatment is directed primarily toward fostering peristaltic rest in the involved segments of the intestine. A smooth, low residue, high caloric diet, to which is added tomato juice and cod liver oil, reduces peristaltic action to a minimum and provides an excess of vitamins C and D. Abdominal pain is controlled by heat or adequate sedatives. Constipation is helped by small amounts of liquid petrolatum or by gently administered warm sodium chloride enemas. Diarrhea is controlled by the frequent administration of 15 Gm. barium sulfate or kaolin and, if necessary, tincture of deodorized opium in effective doses. Surgical intervention has definite indications in the treatment of certain types of intestinal tuberculosis. Granulomatous lesions should be resected. Operative delay may be costly in acute tuberculous appendicitis. Operative delay in perforation of tuberculous ulcers with resulting peritonitis is fatal.

New York State Journal of Medicine, New York

38: 483-600 (April 1) 1938

Dermatitis Due to Bismuth Compounds: Associated with Cutaneous Sensitivity to the Arsenobenzols: Report of Two Cases. J. W. Jordon and H. L. Walker, Buffalo.—p. 483.
Cure of Hydrocele by Injection. L. H. Baretz, Brooklyn.—p. 489.
Tuberculosis Case Finding Among Children: Importance of Certain Age Groups. W. J. Ryan, Pomona.—p. 494.
Anesthetic Practices: Organization in a Teaching Hospital. E. A. Rovenstine, New York.—p. 497.
Teaching Neurology to Undergraduate Medical Students. L. H. Ziegler, Albany.—p. 501.
Every Day Prevention in Mental Health. B. Liber, New York.—p. 505.

38: 601-676 (April 15) 1938

Vesicovaginal Fistulas: Their Cause and Cure. N. F. Miller, Ann Arbor, Mich.—p. 601.
Mental Growth in Epileptic Children. I. N. Kugelmass and Louise E. Poull, New York.—p. 605.
Intracapsular Extraction of Cataract with Iridotomy: Report of 100 Successive Cases with Capsule Forceps. F. Bracken, New York.—p. 610.
Lymphogranuloma Venereum: Present Status. D. Bloom, New York.—p. 616.
Irradiation for Stimulating or Suppressing Menstrual Function. I. I. Kaplan, New York.—p. 626.
*Urogenital Tuberculosis in Infants and Children. M. F. Campbell, New York.—p. 631.
Case of Hemiballismus: Motion Picture Presentation and Necropsy Findings. H. S. Gregory, Binghamton.—p. 635.
Gynecomastia in Lung Tumor: Associated with Pulmonary Tuberculosis. A. Altschul, New York.—p. 637.
Prolapse of Rectum in the Insane. G. L. Fair, Oyster Bay.—p. 641.

Urogenital Tuberculosis in Children.—Campbell believes that by more frequent complete urologic examination in young patients with so-called chronic pyelitis the true incidence of surgical tuberculous renal infection will be found much higher than the present collected data indicate. Exposure to active pulmonary tuberculosis is probably a more important etiologic factor than infection by milk. The renal infection is always secondary to a tuberculous focus elsewhere. When urogenital and skeletal tuberculosis coexist, they may be assumed to be secondary to a common primary focus. The usual urinary symptoms of renal tuberculosis in children commonly lead to the diagnosis of chronic pyelitis and, because symptoms referable to the bladder are the chief complaint in more than three fourths of the cases, cystitis is usually incorporated in the diagnosis. Tuberculosis of the epididymis is practically always secondary to renal tuberculosis. Although genital tuberculosis is uncommon in the young, it must be considered in the differential diagnosis of scrotal swellings. It is unimportant whether the epididymal infection is primarily hematogenous or results from secondary extension from a tuberculous prostate or seminal vesicle, in turn secondarily infected by urine from renal tuberculosis. The disease involves the epididymis primarily; true tuberculous orchitis is almost always a secondary invasion from a caseous epididymis. Epididymectomy is the treatment, yet orchidectomy must be performed when the testicle is secondarily involved. Tuberculous scrotal fistulas must also be excised with the epididymis. Heliotherapy and tuberculin therapy may be of supportive value but should not be relied on to cure the epididymitis. If the prostate is also tuberculous, the vas deferens on the opposite side should be divided between ligatures to prevent tuberculous extension to that epididymis. The symptoms of prostatic and seminal vesical tuberculosis are predominantly those of acute or hyperacute cystitis and result from intense inflammation of the overlying mucosa of the vesical trigon and outlet and of the posterior urethra. Since prostatic and vesicular tuberculosis are associated with or are secondary to renal invasion above or epididymal invasion below, amputation of the involved kidney or epididymis or both is the initial surgical procedure.

Public Health Reports, Washington, D. C.

53: 587-644 (April 22) 1938

Frequency of Surgical Procedures Among 9,000 Families, Based on Nationwide Periodic Canvasses, 1928-1931. S. D. Collins.—p. 587.

53: 645-700 (April 29) 1938

Serums, Antitoxin and Drugs in Treatment of Meningococcic Meningitis. Sara E. Branham.—p. 645.
Studies on Trichinosis: V. Incidence of Trichinosis as Indicated by Postmortem Examinations of 1,000 Diaphragms. M. O. Nolan and J. Bozicevich.—p. 652.

Radiology, Syracuse, N. Y.

30: 407-536 (April) 1938

The Bedside Manner in Radiology. B. H. Orndoff, Chicago.—p. 407.
Integration of Clinical and Roentgenologic Findings in Diagnosis of Carcinoma of Esophagus: Study of 100 Cases. J. T. Farrell Jr., Philadelphia.—p. 412.
Some Important Considerations in Roentgenographic Demonstration of Tissues, Normal and Pathologic, Having a Relatively Low Differential Absorption. J. R. Carty, New York.—p. 417.
Immediate and End Results of Radiation Therapy in Certain Benign Bone Tumors. H. P. Doub, F. W. Hartman and C. L. Mitchell, Detroit.—p. 420.
*Skin Metastasis in Postoperative Irradiated Breast Cancer. F. W. O'Brien, Boston.—p. 437.
Biologic Basis of Fractionated Method of Irradiation of Malignant Tumors. J. Borak, Vienna, Austria; translated by E. T. Leddy, Rochester, Minn.—p. 439.
Tissue Necrosis. A. G. Schpack, Honolulu, Hawaii.—p. 451.
Roentgen Studies of Twins and Triplets. L. G. Rigler, Minneapolis.—p. 461.
*Spontaneous Pneumothorax. D. E. Ehrlich and A. Schomer, New York.—p. 471.
Racial Variations in Incidence of Cancer. G. L. Cheatle, London, England, and M. Cutler, Chicago.—p. 485.
Clinical Observations in Treatment of Cancer by Supervoltage X-Rays. S. G. Mudd, C. K. Emery and L. M. Levi, Pasadena, Calif.—p. 489.
Sharpness of Shadows in Radiography of Lungs. R. R. Newell, San Francisco.—p. 493.
Role of Perirenal Injections of Gas in Radiologic Study of Adrenal Glands. C. Gianturco and C. H. Drenckhahn, Urbana, Ill.—p. 500.

Cutaneous Metastasis in Breast Cancer.—According to O'Brien, in a period of fourteen years (1923 to 1936) 407 cases of pathologically proved cancers of the breast were operated on at the Boston City Hospital. Of these 255 were treated postoperatively by x-rays. Single or multiple cutaneous nodules appeared in fifty-four of these 255 cases. In twenty-two cases cutaneous metastases appeared on an average of 8.14 months after operative intervention, which was frankly incomplete. In thirty-two cases cutaneous metastases appeared on an average of 14.6 months following the classic radical resection. There were ten of these cases, however, in which palpable axillary and supraclavicular glands were present before operation and the radical operation should not have been done. Cutaneous metastases did not appear for an average of 18.5 months in the twenty-two cases in which palpable nodes were absent and radical operation was performed. These statistics indicate that the appearance time of cutaneous metastasis in this group of breast cancers treated postoperatively by x-rays was directly related to the extent of the growth at the time of operation. There was no evidence that the kind of tumor influenced the appearance time of cutaneous metastases. However, cutaneous metastasis appeared with relative promptness following incomplete or injudicious surgery. If postoperative irradiation is of any value in inhibiting cellular growth and the distribution of cancer emboli, preoperative irradiation ought to be of greater value, for with the breast and axilla intact, larger amounts of radiation may be administered to these areas without damage to the wall of the chest and axillary vessels.

Spontaneous Pneumothorax.—Ehrlich and Schomer advance a theory of idiopathic spontaneous pneumothorax which depends on the location of a visceral pleural defect during natural "wear and tear." It is based on the assumption that, no matter what the cause of pleural and lung laceration, the location is what determines whether or not pneumothorax takes place. The size of the laceration is not a determining factor. If the tear involves bronchi, bronchioles, respiratory bronchioles or even alveoli lining the wall of a respiratory bronchiole, the atmospheric pressure in the trachea and bronchi by fairly direct communication exerts sufficient force to drive air into the pleural cavity and cause a pneumothorax. On the other hand, a laceration may involve numerous intercommunicating alveoli and not produce a pneumothorax. The authors are of the opinion that in normal respiration the gliding of the visceral over the parietal pleura causes a continuous shedding and regeneration of the pleural mesothelium. A slight defect in the regeneration at some point, if located in a portion of a lung lobule or lobules involving one or more bronchioles, will, when accompanied by a respiratory effort of greater or lesser severity, cause a tear in the visceral pleura and a pneumothorax will follow. Of course the lack of probability of such an accident in this location is what makes true "idiopathic" spontaneous pneumothorax of rare occurrence. Sudden sharp pain in one side of the chest accompanied by increasing dyspnea and possibly collapse suggests spontaneous pneumothorax; physical signs and x-ray examination corroborate it. Prognosis is much better in the open and closed types. The valvular type causes the most severe symptoms, and owing to the treatment necessary makes this type more prone to complications; e. g., serous or purulent effusion. Uncomplicated spontaneous pneumothorax without distressing symptoms requires only rest and symptomatic medication. If dyspnea becomes severe and the side of the pneumothorax is greatly distended with air, as is almost always the case in the valvular type, deflation should be resorted to.

Rhode Island Medical Journal, Providence

21: 73-86 (May) 1938

Psychiatry and the Criminal Law. C. A. Walsh, Providence.—p. 73.
Development of the Human Heart. A. Barry, Cambridge, Mass.—p. 76.

South Carolina Medical Assn. Journal, Greenville

34: 115-146 (May) 1938

Lymphocytic Choriomeningitis: Report of Proved Case with Recovery. F. E. Zemp, Columbia.—p. 115.
Fifty-Two Years a Devotee of Medicine. G. P. Neel, Greenwood.—p. 116.
Silicosis. H. F. Wilson, Columbia.—p. 117.
Some Ocular Manifestations of Syphilis. P. G. Jenkins, Charleston.—p. 121.

Southern Medical Journal, Birmingham, Ala.

31: 465-578 (May) 1938. Partial Index

Observations on Pathology and Pathogenesis of Acute Poliomyelitis in Recent Epidemic in Arkansas. A. F. DeGroat, Little Rock, Ark.—p. 475.
*Undulant Fever (Brucellosis) Treated with Sulfanilamide: Report of Case with Recovery. E. C. Toone Jr. and A. M. Jenkins, Richmond, Va.—p. 478.
Electrocardiogram in Rheumatic Fever. L. C. McGee, Elkins, W. Va.—p. 480.
*Relationship of Porphyrinuria to Human Pellagra: Note. T. D. Spies, Y. Sasaki and Esther Cross, Cincinnati.—p. 483.
Clinical and Experimental Studies with Noninvagination of Appendical Stump. J. K. Donaldson and H. S. Thatcher, Little Rock, Ark.—p. 488.
Lumbosacral Anomalies as Cause of Low Backache. W. Clarkson and A. Barker, Petersburg, Va.—p. 515.
Displacement of Intervertebral Cartilage as Cause of Back Pain and Sciatica. E. F. Fincher and E. B. Walker, Atlanta, Ga.—p. 520.
Treatment of Pneumonias with Deuteroproteose. C. Brooks, New Orleans.—p. 534.
Malignant Melanomas, with Particular Reference to Subungual Type. C. E. Newell, Chattanooga, Tenn.—p. 541.
Differential Diagnosis and Treatment of Lesions Obstructing Lower Portion of Esophagus. P. P. Vinson, Richmond, Va.—p. 548.

Undulant Fever Treated with Sulfanilamide.—Toone and Jenkins report the cure of a case of undulant fever (Brucella abortus, suis strain) in a Negro male patient. The diagnosis was confirmed by blood culture, agglutination and the Brucella abortus opsonophagocytic index. A rapid fall in temperature to a normal level associated with symptomatic improvement and negative blood cultures followed promptly after the administration of 450 grains (29 Gm.) of sulfanilamide over a period of eleven days.

Relationship of Porphyrinuria to Human Pellagra.—Spies and his associates believe that an increased excretion of porphyrin in the urine of twenty pellagrins, irrespective of the presence of dermatitis, indicates that increased porphyrinuria is an integral part of the syndrome of pellagra. The increased porphyrinuria does not parallel the severity of the clinical manifestations of pellagra. In this study it reached a peak in the majority of cases early in the course of the disease and in four cases the porphyrin excretion returned to normal despite the fact that the patients ate only a basic diet. Coproporphyrin 1 and 3 have been isolated from the urine in two classic cases of pellagra. It appears that an inadequate amount of nicotinic acid may impair hepatic function, which is followed by an abnormal formation of coproporphyrin 3. It would seem that the following working hypothesis might be advanced tentatively: In the absence of nicotinic acid the function of the liver is

impaired and coproporphyrin 3 is formed. This coproporphyrin is an abnormal product of porphyrin metabolism and is a sensitizing agent. Clinical observations show that certain pellagrins with large amounts of porphyrin in the circulation are not affected by prolonged exposure to the sun and that when there is a sensitizing effect it varies greatly with the individual patient.

Tennessee State Medical Assn. Journal, Nashville

31: 125-164 (April) 1938

Treatment of Malaria. W. C. Colbert, Memphis.—p. 125.
Surgery in Patients of Advanced Age. B. Brooks, Nashville.—p. 128.
Angina Pectoris and Coronary Occlusion: Diagnosis and Treatment. P. H. Levinson, Chattanooga.—p. 136.
Radium: Indispensable Means of Therapy in Its Field of Service to Humanity. J. L. Crook, Jackson.—p. 144.

Texas State Journal of Medicine, Fort Worth

33: 791-874 (April) 1938

Endocrinology in Pediatrics. H. Hosen, Port Arthur.—p. 797.
Ethnic Factors in Anorectal Disease. C. Rosser, Dallas.—p. 805.
Fundamentals in Treatment of Cancer of the Breast. J. T. Moore, Houston.—p. 808.
Due Consideration of the Unborn. J. M. Horn, Brownwood.—p. 811.
Iris in Cataract and Glaucoma: The Management of the Iris in the Operation of Cataract Removal. J. O. McReynolds, Dallas.—p. 817.
Local Allergy of the Eye Due to Orris Root: Case Report. W. E. Muldoon and I. S. Kahn, San Antonio.—p. 822.
State Medicine: A Challenge to the Medical Profession. J. M. Travis, Jacksonville.—p. 824.
Water Conservation: A New Problem in Malarial Control. C. K. DeBusk, Jacksonville.—p. 826.
Esophageal Obstruction: Case Reports. S. Israel, Houston.—p. 828.

34: 1-64 (May) 1938

Orthopedic Conditions in Children: Review of 313 Cases. W. G. Stuck, San Antonio.—p. 6.
Rational Treatment of Chronic Arthritis. P. M. Keating, San Antonio.—p. 13.
Minor Surgery. K. H. Aynesworth, Waco.—p. 18.
Brucellosis. F. T. McIntire, San Angelo.—p. 22.
Encephalitis Lethargica. B. L. Jenkins, Clarendon.—p. 27.
Functions of the County Medical Society. G. Turner, El Paso.—p. 32.
Communicable Diseases in the Preschool Child. H. Tucker, Nacogdoches.—p. 35.
*Chronic Otitis Media, Conservative Treatment. H. Donnell, Waxahachie.—p. 39.
Ocular Birth Injuries of the Newborn. H. M. Block, Dallas.—p. 43.

Treatment of Chronic Otitis Media.—Donnell ceased the use of watery irrigation in the treatment of acute or chronic infections of the ear. The so-called dry treatment avoids many of the objections to watery solutions. The objection is not alone the soggy condition of the external canal but also the fact that many of these infections are kept active by the irrigative solution in the middle ear. The dry treatment is carried out by the use of cotton wicks. The wicks are changed as often as one fourth of their length is wet. It may be necessary to change them every ten or fifteen minutes if the discharge is profuse. If it is felt that one must irrigate an acute or chronically infected ear, it is best to use 70 per cent alcohol. Most chronically infected ears will heal if kept clean. Pratt in 1930 suggested what may be called "continuous drainage" by the use of cotton wicks. His method is to roll cotton on an applicator and clean the ear and then cotton in the form of a wick is left in the canal a little distance from the tympanum and replaced as often as it is soiled. The cotton wick should be long enough to rest comfortably on the tympanum and to protrude far enough from the external canal to be removed easily. It should not be large enough to fill completely the canal, as that would tend to make a soggy condition of the membrane and canal, which would be inimical to healing and could possibly cause furunculosis. About six years ago the author began the use of vitamins in the treatment of all chronically infected ears. Halibut or cod liver oil, to the equivalent of three or more teaspoonfuls of standard cod liver oil, and from three to six brewers' yeast tablets a day with the addition of orange or lemon juice to the diet have been used. The results have been satisfactory. With the wicks, which by capillary attraction are a form of continuous drainage, and the vitamins, infected ears have healed and a secondary membrane has formed when all other conservative means of treatment have failed.

Virginia Medical Monthly, Richmond

65: 251-314 (May) 1938

Acute Sinusitis in Children. G. S. Fitz-Hugh, Charlottesville.—p. 251.
Are We Too Sinus Conscious? M. Edmunds, Petersburg.—p. 255.
The Care of the Aged. B. P. Seward, Roanoke.—p. 261.
*The Value of Posture in Evacuation of Secretion from Tracheobronchial Tree. P. P. Vinson, Richmond.—p. 270.
Fever, Malaria and Short Wave in Treatment of Neurosyphilis. J. A. Shield, Richmond.—p. 271.
Implantation of Costal Cartilage for Correction of Nasal Deformities. E. G. Gill, Roanoke.—p. 279.
Analgesia and Anesthesia in Obstetrics. W. McMann, Danville.—p. 281.
Traumatic Laceration of Inferior Vena Cava, with Recovery: Case Report. W. P. Barnes, Richmond.—p. 285.
Agranulocytosis: Report of Case. W. H. Chapman Jr., Suffolk.—p. 287.
Various Manifestations of Late Toxemia Occurring in Successive Pregnancies. A. Weinberg, Baltimore.—p. 290.
Use of Sulfanilamide in Meningococcic Meningitis with an Unusually Rapid Recovery in One Apparently Hopeless Case. R. D. Bickel, Roanoke.—p. 293.
Breech Presentation. A. J. Russo, Richmond.—p. 295.

Posture and Drainage of Tracheobronchial Tree.—Vinson believes that the most satisfactory method of drainage by posture is to have the patient kneel on the edge of a chair or low table and place his hands on the floor. In this way the trachea is so inverted that secretion in the lungs descends by gravity. In many instances large quantities of sputum will be expelled by such change in position. The benefit following drainage by gravity is sufficiently uncertain to make it inadvisable for patients who have tuberculous lesions or who are seriously debilitated. Pulmonary abscess usually is associated with a stricture in the bronchus communicating with the area of infection in the lung and, until this stricture is dilated to permit the flow of pus, change in posture will not be beneficial. After the stricture has been dilated, change in posture to promote drainage is seldom required. In chronic bronchiectasis, drainage of the lungs by posture may be helpful in reducing the amount of fetor of the secretion and in limiting expectoration to convenient periods of the day. But when bleeding is occasioned by postural drainage it should not be employed. The time of drainage should always be before meals and before retiring at night. If postural drainage is attempted after meals, vomiting may occur. A few patients with bronchiectasis may find that the flow of secretion from the lung does not begin until after breakfast, in which case inhalation of steam for ten or fifteen minutes will promote drainage. Regular postural evacuation of the tracheobronchial tree will lessen absorption of secretion, reduce the odor of the sputum and limit the cough and expectoration to convenient periods of the day. This treatment will not cure bronchiectasis, but it enables a patient to work with others without odor to his breath and without constant cough, which arouses the suspicion of tuberculous disease.

West Virginia Medical Journal, Charleston

34: 193-240 (May) 1938

*Chronic Nontuberculous Lung Infections. J. H. Skavlem, Cincinnati.—p. 193.
Pulmonary Tuberculosis. K. M. Jarrell, Beckley.—p. 203.
Pelvic Abscess. W. S. Gardner, Baltimore.—p. 210.
Importance of Hoarseness as an Early Symptom of Laryngeal Malignancy. F. D. Woodward, University, Va.—p. 211.
Roentgen Ray Treatment of Inflammatory Lesions. V. L. Peterson, Charleston.—p. 213.
Physiotherapy: Its Growth and Place in Practice. C. M. Bray, Morgantown.—p. 215.
Poisoning by Aniline Contained in Shoe Dye: Report of Case. J. L. Wade, Parkersburg.—p. 218.
Volvulus of Sigmoid Producing Complete Intestinal Obstruction Associated with a Seven and One-Half Months Pregnancy: Report of Case. W. Bronaugh and W. R. Yeager, Parkersburg.—p. 220.
Partial Atelectasis of Lung: Report of Two Cases. I. A. Bigger, G. D. Vermilya and P. P. Vinson, Richmond, Va.—p. 222.
Terata Katadidyma. J. T. Mallamo, Fairmont.—p. 224.

Chronic Nontuberculous Lung Infections.—Skavlem believes that it is a grave mistake to treat any patient for tuberculosis because of chronic cough, expectoration and blood spitting, in the absence of positive tuberculous sputum, unless the possibility of other causes has been carefully considered and disproved. With such differential studies in mind he discusses other chronic infections of the lungs. These include bronchiectasis, bronchial dilatation, functional disturbances, cough, congenital cystic disease, abscess, distention of the bronchus, gangrene, syphilis, mycotic infection and tularemia.

FOREIGN

An asterisk (*) before a title indicates that the article is abstracted below. Single case reports and trials of new drugs are usually omitted.

British Journal of Dermatology and Syphilis, London

50: 167-220 (April) 1938

Bullous Iodide Eruption in Association with Malignant Endocarditis and Nephritis. H. G. Adamson.—p. 167.
Ehlers-Danlos Syndrome: Case. M. Bolam.—p. 174.
Progressive Melanosis of the Skin. F. R. Bettley.—p. 181.

British Journal of Ophthalmology, London

22: 193-256 (April) 1938

Value of Orthoptic Training. F. W. Law.—p. 193.
Use of Sodium and Mercury Vapor Lamps in Ophthalmoscopy. A. J. Ballantyne.—p. 204.
Histology of Bowman's Membrane in Cases of Glaucoma. G. Talbot.—p. 210.
Exfoliation of Lens Capsule in Glaucoma. A. Garrow.—p. 214.

British Medical Journal, London

1: 713-764 (April 2) 1938

Alkaloid Ephedrine. J. H. Gaddum.—p. 713.
Amenorrhea: Its Etiology and Treatment. T. N. MacGregor.—p. 717.
Rate of Sedimentation of Red Blood Cells as a Clinical Test in General Practice. E. Scott.—p. 722.
*Ascorbic Acid in Bronchial Asthma: Report of Therapeutic Trial on Twenty-Five Cases. H. B. Hunt.—p. 726.
The Female Climacteric and the Menopause. H. R. Donald.—p. 727.

1: 765-828 (April 9) 1938

Interaction of Pregnancy and Associated Disease. R. W. Johnstone.—p. 765.
Calcium and Phosphorus Deficiencies in a Poor Human Dietary. W. E. Gaunt, J. T. Irving and W. Thomson.—p. 770.
Fracture of the Neck of the Femur. H. A. Brittain.—p. 773.
Malignant Tumor of Thymus Gland. R. G. P. Evans.—p. 775.
Spontaneous Hemopneumothorax. J. Maxwell.—p. 778.
Extra-Uterine Gestation: Live Child. F. Stabler.—p. 779.

Cevitamic Acid in Bronchial Asthma.—In view of certain evidence that cevitamic acid may play a part in allergic conditions, particularly asthma, Hunt dispensed cevitamic acid in tablets of 50 mg. to twenty-five asthmatic patients. Other allergic symptoms were present in seventeen cases and chronic bronchitis in nine. The patients were instructed to take two of these tablets daily. During this treatment no medicine or injections such as vaccines were given, apart from antispasmodics or medicine for a troublesome cough. No evidence could be found of any marked improvement in the amount of wheezing, the incidence of attacks or the general condition. None of the five patients (other than the twenty-five) who received intramuscular injections of 500 mg. or more of the acid experienced any relief in their symptoms after a period of from twenty to thirty minutes, and the amount of epinephrine subsequently required to relieve the spasm was in no way diminished. Thus it was impossible to confirm the statement of Hochwald (1936) that asthmatic symptoms could be relieved by large intravenous injections of cevitamic acid.

Edinburgh Medical Journal

45: 245-308 (April) 1938

Suicide. D. K. Henderson.—p. 245.
XXIII. Modern Anesthesia and the General Practitioner of Tomorrow. J. Gillies.—p. 264.
Debatable Tumors in Human and Animal Pathology: IV. "Mixed Tumors" of Salivary Glands. W. F. Harvey, E. K. Dawson and J. R. M. Innes.—p. 275.
*Myocardial Infarction: Pathologic Study. R. M. M. Lyon.—p. 285.

Myocardial Infarction.—Lyon reviewed the necropsy records of 3,200 consecutive cases in the Royal Infirmary during the period from 1931 to 1935 and found evidence of a definite myocardial infarct in 110 instances. Certain cases showed recent infarcts, while others had the fibrous scars of previous large infarcts, sometimes causing aneurysm of the ventricular wall. The incidence of infarction in the postmortem room was found to be 3.44 per cent. The sex incidence was seventy men and forty women. The average age of the patients at death was 61.21 years. Twenty-nine of the subjects died of some other disease and their myocardial infarction did not appear to have contributed materially to their deaths. The infarctions in women occurred at a slightly later age period. Syphilitic aortitis was present in eight out of seventy men but in only one woman, and in this case the coronary vessels were not involved by the syphilitic process. Only eight patients had had diabetes, but there was a female preponderance of five cases to three. No other disease, apart from arteriosclerosis, appeared to be related to the occurrence of infarction. The 110 patients showed a total of 122 infarcts, twelve patients having two separate infarcts. Only five of the 122 infarcts were of the right ventricle. Pericardial friction, when present, is one of the important clinical signs of an infarction. Seventy-three of the patients were carefully examined at the time of their infarction and daily afterward. If the thirteen dying within twenty-four hours are excluded there remain sixty patients in whom friction might possibly have been heard. In only nine cases (15 per cent), however, was friction detected. Friction should be looked on as an important diagnostic sign if present, but its absence should not negate the diagnosis of infarction. Approximately half of the patients died within one month of their acute attack.

Irish Journal of Medical Science, Dublin

No. **148:** 145-192 (April) 1938

Desirability of Compulsory Notification of Measles and Whooping Cough. C. J. McSweeney.—p. 145.
Some Aspects of Food Inspection. P. F. Dolan.—p. 151.
Diagnosis and Treatment of Hydatidiform Mole. J. F. Cunningham.—p. 161.

Journal of Mental Science, London

84: 1-254 (Jan.) 1938

The Eighteenth Maudsley Lecture: Science and Psychiatry. F. Golla.—p. 4.
Huntington's Chorea: Study of Thirty-Four Families. L. Minski and E. Guttmann.—p. 21.
Some Problems of Histologic Diagnosis and Interpretation of Circulatory Disturbances in the Brain. A. Meyer.—p. 97.
Schizophrenia-like Psychoses in Young Children. R. A. Q. Lay.—p. 105.
Control of Dysentery by Prophylactic Inoculation. K. C. L. Paddle.—p. 134.
Insulin Treatment of Schizophrenia: I. Recent Advances in Insulin Treatment. H. P. Strecker.—p. 146.
Id.: II. Hypoglycemic Treatment of Schizophrenia: Some Impressions. A. A. W. Petrie.—p. 156.
*Insulin Therapy: Review, with Special Reference to Mechanism of Cure. R. Freudenberg.—p. 165.
Somnifaine Narcosis: Results of Forty Treatments in Thirty-Eight Cases. J. Kearney and P. J. Courtney.—p. 177.
Some Developments, Legal and Administrative, in Mental Treatment. R. H. Curtis.—p. 183.
Responsibility in Mental Disorder, with Special Reference to Algolagnia. W. N. East.—p. 203.

Insulin Therapy in Schizophrenia.—Although the metabolic observations in schizophrenia are not absolutely specific, Freudenberg believes that the following hypotheses concerning its basis and the mechanism of cure can be regarded as established. In schizophrenia there is probably a primary disturbance in cerebral respiration, perhaps due to some lack of oxygenating substances. This disturbance leads to a collection of toxic products, probably originating from the metabolism of protein. Insulin therapy induces the oxybiotic processes necessary for detoxication and also an irritation of the cell membranes, which results in an increased exchange between the cells and their surroundings. Similar but more sudden changes take place in metrazol therapy. Improved cerebral oxidation and the alkalosis occurring during hypoglycemic coma may be two factors of great importance in the recoveries seen after insulin therapy.

J. Royal Inst. Public Health and Hygiene, London

1: 377-438 (April) 1938

Mental Hygiene in Modern Life. H. Yellowlees.—p. 387.
*Use of Plaster Splints in Arthritis. C. E. Kindersley.—p. 400.
Some Problems in the Management of Antenatal Clinics. Letitia D. Fairfield.—p. 408.
The Staffing of Antenatal and Child Welfare Clinics from the Point of View of: The Obstetrician. F. J. Browne.—p. 412.
Id.: The Pediatrician. C. J. K. Hamilton.—p. 417.
Id.: The Medical Officer of Health. V. Borland.—p. 421.
Id.: The General Practitioner. Helen Lukis.—p. 430.

Plaster Splints in Arthritis.—Kindersley lists three main principles that underlie the treatment of arthritic joints: rest, maintenance of such a position of the joint as will allow the least strain on the surfaces of the joint and maintenance of an adequate range of movement. There is no more satisfactory way of procuring rest than by adequate splintage. A perfect splint

is the only method of maintaining the best possible function with the least strain. Adequate range of movement, with removable plaster of paris splints, can be achieved by a daily exercise of the joint.

Journal of Tropical Medicine and Hygiene, London

41: 109-124 (April 1) 1938

*Advantages in Use of Plasma Rather Than Serum for Certain Immunologic Procedures, with Special Reference to Its Use in Tests for Syphilis. K. L. Burdon.—p. 109.
New Species of Genus Microsporum, Microsporum Stilliansi, Benedek, 1937, N. Sp., with Special Consideration of Phenomenon of Dissociation in Fungi Imperfecti. T. Benedek.—p. 114.
Unsuccessful Attempts at Curing Schistosomiasis by Oral Tablets. F. G. Cawston.—p. 118.

Plasma for Immunologic Procedures.—According to Burdon, the two circumstances that favor the use of plasma for immunologic tests are that a specimen of plasma may be secured more easily and more rapidly than a specimen of serum (since waiting for the separation of serum from the clot is unnecessary and even centrifugation may be avoided) and that plasma has a demonstrably higher content of antibody than serum from the same individual. The specific reactivity of plasma is interfered with in the fresh unheated specimen, but heating at 56 C. for only ten minutes is sufficient to remove the disturbing factors and to bring out the full specific activity. After the heating, brief centrifugation is all that is necessary to make the specimen of plasma ready for testing. Tests for syphilis on plasma by the Kline microscopic technic or by the Kahn method are as simple to perform and as reliable as the usual tests on inactivated serum, and they may be carried out in much less time. There is a close agreement in the reaction of the serum and the plasma of the same individual in Kline and Kahn tests, but plasma shows a consistent tendency to give a stronger reaction than the corresponding serum. The sensitivity of the reactions of plasma is not likely to lead to false conclusions but, on the contrary, it may be distinctly advantageous in the diagnosis of early syphilis and in following the effect of therapeutic procedures. The increased reactivity of plasma over that of serum of the same individual is not due to the presence of the sodium citrate in 0.1 per cent concentration in the plasma.

Lancet, London

1: 763-818 (April 2) 1938

The Hygiene of a Quiet Mind. Horder.—p. 763.
Juvenile Rheumatism: The Therapeutic Aspect. W. Sheldon.—p. 767.
*Porphyrinuria Following Sulfanilamide: Sulfanilamide Dermatitis. C. Rimington, assisted by A. W. Hemmings.—p. 770.
Significance of Fits in Insulin Therapy of Schizophrenia. L. A. Finiefs.—p. 776.
*Enteric Fever Treated with Suprarenal Cortex Extract and Vitamin C Intravenously. Najib-Farah.—p. 777.

Porphyrinuria Following Sulfanilamide.—Rimington and Hemmings examined the twenty-four hour specimens of urine for their content of porphyrin from patients receiving sulfanilamide, and abnormally high values were recorded in nearly every case. Sulfanilamide administered to healthy white rats in doses averaging 0.307, 0.278 and 0.079 Gm. per rat daily for periods up to thirty days also gave increase in urinary and fecal porphyrin excretion in each instance; values as high as ten times the normal were recorded. The animals had polyuria during the first days after dosing was instituted and declined somewhat in weight. No other signs of toxicity were observed. The presence of a slight degree of photosensitivity was determined as the result of exposure to ultraviolet rays. The symptoms of acute porphyrinuria bear some resemblance to those reported as a result of sulfanilamide intoxication. The relative proportions of series I and III porphyrins may prove helpful in explaining individual idiosyncrasies toward the drug, especially as regards the manifestation of sulfanilamide rash or dermatitis. When administration of the drug to rats is discontinued a slow return of the urinary porphyrin figure toward the normal level occurs, but this may take several weeks. Animals killed at the height of sulfanilamide dosing present only a slight degree of histologic abnormality in the liver and kidneys, but the spleens are of a blackish brown, much engorged and show extensive deposits of a greenish brown granular pigment, much stainable iron and a certain amount of porphyrin (observed fluoroscopically). The histologic picture had not returned to normal within twenty-eight days after dosing of sulfanilamide was discontinued. The available evidence would suggest that a certain degree of destruction of blood cells is caused by sulfanilamide in the doses employed. The disturbance in the metabolism of pigment is not to be explained by this fact alone. A more deep-seated effect on the hemopoietic system is suspected, analogous, possibly, in some ways to the toxic action of lead.

Adrenal Cortex Extract and Vitamin C in Enteric Fever.—Experimental and pathologic observations prove that the endocrine system, particularly the adrenals, has a defensive role in infection. As soon as the diagnosis of enteric fever is established, Najib-Farah begins to give intravenous injections of adrenal cortex extract, in doses between 5 and 20 cc., according to the age and state of the patient, with from 500 to 1,000 mg. of vitamin C. The two products are mixed in the same syringe, since they seem to be more active when injected together. During the same day two more doses of 500 mg. of vitamin C are injected at intervals of four hours; no oral medication is given but an ice bag is applied to the abdomen and occasionally to the head until the temperature falls. Administration of adrenal cortex extract and vitamin C is continued for from five to twelve days and is followed by two intravenous injections daily of 500 mg. of vitamin C alone for at least seven days. In fifteen cases of confirmed enteric fever (seven typhoid, three paratyphoid A, five paratyphoid B) and three cases of acute Bacillus coli infection which were treated in this way, the results were with one exception immediately favorable, the exception being a moribund patient with typhoid to whom this treatment was given as a last resort. The injections produce no pain, shock or reaction. There is abundant urination and a gradual fall of temperature to normal between the third and seventh days. Symptoms disappear rapidly, except perhaps the cough, which may need an expectorant, and the patient is soon able to take nourishment. In one case vomiting persisted after the fall of temperature but was stopped by subcutaneous dextrose-saline solution and in two toxic cases dextrose-saline solution had to be given to maintain the sodium equilibrium and to avoid dehydration.

1: 819-874 (April 9) 1938

Function of Bronchial Tubes. M. Ellis.—p. 819.
Gout. L. C. Hill.—p. 826.
*"Alcoholic" Beriberi. N. L. Price.—p. 831.
Pulmonary Atresia and Hypertrophy of Bronchial Arteries. T. East and W. G. Barnard.—p. 834.
Diphtheria Outbreak Associated with Ice Cream. E. Bloch.—p. 837.
Abdominal Aortic Aneurysm Associated with General Paralysis of the Insane. E. L. Hutton and A. J. Galbraith.—p. 838.

"Alcoholic" Beriberi.—Price cites a case of cardiac failure with polyneuritis in an alcoholic addict. It is similar to those in the acute group (secondary beriberi with severe cardiac failure in alcoholic addicts) described by Weiss and Wilkins in 1936. The cases appear to bear a sufficiently close resemblance to "wet" beriberi of the orient to warrant the belief that they share with it a common pathogenesis. The term "alcoholic" beriberi seems an appropriate and convenient title for the condition. The patient recovered completely after treatment by rest, a high calory diet and large amounts of vitamin B. The clinical features of value in diagnosis include reversible cardiac enlargement, shortening of the electrocardiographic conduction periods and a positive Aalsmeer test due to the morbid sensitivity of the circulation to epinephrine. The multiple factors concerned in the evolution of alcoholic beriberi include defects in diet and assimilation acting in conjunction with increased tissue requirement of vitamin B_1 due to an increase in rate, or alteration in type, of metabolism.

1: 875-924 (April 16) 1938

Some Deficiencies of Nutrition and Their Relation to Disease: I. Origin and Detection of Nutritional Deficiencies. C. C. Ungley.—p. 875.
*Schick Reaction and Circulating Diphtheria Antitoxin in Man. H. J. Parish and Joyce Wright.—p. 882.
*Sulfanilamide in Treatment of Chancroid. H. M. Hanschell.—p. 886.
Effect of Antithyrotropic Serum on Action of Human Thyrotropic Hormone. C. L. Cope.—p. 888.

Schick Reaction and Circulating Diphtheria Antitoxin.—Parish and Wright confirm the observations of Jensen and others that there does not exist a fixed antitoxin titer (the "Schick level") above which persons are Schick negative and below which they are Schick positive. Nevertheless, there is a much higher level of circulating antitoxin in groups of Schick-

negative than in groups of Schick-positive persons. One hundred and fourteen persons undergoing a course of immunization, many of whom were expected to have "borderline" immunity, were Schick tested. Blood samples were taken immediately before the Schick test and revealed a wide zone of circulating antitoxin values corresponding to positive, negative and doubtful Schick reactions. Similar tests were made with "multiple Schick toxins," sixty-one persons being tested with fourfold and thirty-nine with tenfold reagents. Negative reactions to the fourfold reagents were obtained in persons with as little antitoxin as from 0.002 to 0.0005 unit and to tenfold reagents with as little as from 0.01 to 0.002 unit per cubic centimeter. Pseudoreactions with fourfold and especially with tenfold reagents tended to make readings difficult and to produce discomfort in protein-sensitive persons. The routine use of these preparations cannot therefore be recommended. The Schick test has been of proved value in many immunization campaigns, but a negative reaction may not indicate in all cases a state of immunity sufficient to withstand attack by virulent gravis or intermediate strains. To maintain a sufficiently high "level of immunity," the periodic injection of prophylactic into Schick-negative as well as positive reactors may be considered advisable.

Sulfanilamide for Chancroid.—Hanschell treated his last twenty cases of chancroid with sulfanilamide. Each patient received deep subcutaneous injections of 5 cc. of a solution of prontosil soluble, and one or two further injections of 10 cc. at intervals of three days in addition to prontosil album by mouth in divided doses, 3 Gm. in twenty-four hours. There has been rapid healing of the ulcer without leaving the old precipitous-edge scar and rapid subsidence of the bubo in from five to ten days.

Medical Journal of Australia, Sydney

1: 597-638 (April 2) 1938

*Interpretation of MacLean's Urea Concentration Test in Assessing Renal Function in Pregnancy. Vera I. Krieger.—p. 597.
Prophylaxis of Gas Gangrene in Man. W. J. Penfold and J. C. Tolhurst. —p. 604.
Lupus Vulgaris and Significance of Certain Nonspecific Eruptions in Relationship to Tuberculosis. J. E. McGlashan.—p. 607.
Some Experiences of Prostatic Surgery in a Provincial City: Report of 109 Cases. G. R. Davidson.—p. 611.
Diagnosis of Tuberculous Diseases of the Globe. J. B. Hamilton.—p. 619.
Treatment of Clonic Facial Spasm by Nerve Anastomosis. G. Phillips. —p. 624.

Urea Concentration Test and Renal Function.—Krieger has established that, when the normal concentrating power of the kidney is found in association with a small secretion of urine after 15 Gm. of urea has been given, the total amount of urea excreted in the three hours of the test gives a more satisfactory measure of renal efficiency than the percentage concentration of urea in any of the single hourly specimens in the MacLean urea concentration test. The possible combinations of total urea excreted in three hours in relation to the volume of urine secreted are as follows: Normal total urea excreted in a normal, small and large volume of urine in three hours and a small total urea excreted in a normal, small and large volume of urine in three hours. An analysis was made of the 703 urea concentration tests from 437 pregnant patients. The standard of normality used for this classification was that at least 4 Gm. of urea must be secreted in from 150 to 300 cc. of urine during the three hours following ingestion of 15 Gm. of urea in 100 cc. of water. From a consideration of the clinical data presented it is evident that there is agreement between the clinical condition of the patient and the renal efficiency assessed by the total excretion of urea in the MacLean test. More than 50 per cent of the tests on patients in severe and prolonged toxemias exhibited renal inefficiency in the antepartum period. In the puerperium a greater percentage of patients with poor renal function were again found among the toxemic patients. The total number of tests in which the total excretion of urea in three hours aided in determining kidney function was seventy-nine previously termed normal and shown to represent inefficiency and forty-five in which the efficiency was "uncertain" and which have been definitely established as "inefficient." By modifying the interpretation of the MacLean urea concentration test so that efficiency is determined by the total excretion of urea, 17.6 per cent more tests were shown to indicate renal inefficiency than when the concentrating power was used as the determining factor. Among the normal pregnant patients 69 per cent of tests fell in the normal groups and 20 per cent in the groups indicating renal inefficiency. In the severe toxemias (preeclampsia, nephritis and eclampsia) only one third to one fifth of the tests showed normal renal function and from one half to two thirds indicated renal damage. Among the less severe toxemias (albuminuria) the highest incidence of "doubtful" results occurred. The incidence of tests indicating normal function or renal damage is thus in agreement with the severity of the toxemia in this series of results obtained under entirely different experimental conditions from those described earlier. Renal damage is indicated (1) when a low percentage of urea is excreted in a small volume of urine resulting in a low total excretion of urea in three hours, (2) when a low percentage of urea is excreted in a large volume of urine but the total excretion of urea in three hours is low, (3) when a normal percentage of urea is excreted in a small volume of urine so that the total excretion of urea is low, and (4) when the percentage of urea for one of the three hours is normal or high, but excreted in a small volume of urine and the percentages of urea in the two remaining samples are low so that the total excretion of urea in three hours is low. When a small percentage of urea is excreted in a large volume of urine so that the total excretion of urea is normal or high, the interpretation is uncertain.

Tubercle, London

19: 289-336 (April) 1938

Silicosis in the British Coalfields. W. E. Cooke.—p. 289.
*Erythrocyte Sedimentation Rate in Pulmonary Tuberculosis. A. Rest.—p. 307.
Further Studies on Methods of Desensitization of Tuberculous Guinea Pigs. J. D. Thayer.—p. 313.

Sedimentation Rate in Pulmonary Tuberculosis.—Rest studied 4,867 sedimentation tests on 944 patients with pulmonary tuberculosis from 1926 to 1935. He draws the following conclusions: 1. The erythrocyte sedimentation test is of no diagnostic value. 2. The sedimentation rate is of no value in diagnosing the extent of the pulmonary lesion. Although almost all the nontuberculous patients and those with lesions of minimal extent fell within the low sedimentation groups, many of the patients in the low groups suffered from far advanced disease. A low sedimentation rate in a patient with definite pulmonary tuberculosis generally indicates the presence of an inactive, nonprogressive type of chronic fibroid tuberculosis. In a small number of patients a normal sedimentation rate does not definitely exclude activity; but definite and pronounced clinical activity and persistently low sedimentation rates are rare. Usually the sedimentation rate becomes markedly accelerated. 3. In the presence of clinically demonstrable tuberculosis, acceleration of the sedimentation rate definitely indicates, or at least strongly suggests, active and progressive disease. It indicates that the body has been severely damaged by the disease. There was a slowing of the rate in some far advanced rapidly progressive cases, probably because of anergy. Occasionally, high sedimentation rates occur in patients with little if any evidence of clinical activity. As a rule, however, this foreshadows the eventual onset of symptoms of activity and progression of the lesion. 4. Slowing of the sedimentation rate, or a return to a normal level, is a striking and, in the majority of patients, a usual accompaniment of clinical improvement and subsidence of symptoms and signs, especially those of toxemia. The sedimentation rate is an index of the condition of the patient at that time. It is of considerable value in prognosis. It was found that the number of deaths increased with the degree of acceleration of the sedimentation rates. 5. The test is of considerable significance in the treatment of patients in regard to rest and exercise. Patients with a persistently high sedimentation rate should be kept more strictly at rest than those with fairly normal rates. 6. The sedimentation rate is of no value in the differential diagnosis between pulmonary tuberculosis and other pulmonary diseases. With the help of the test one can differentiate between an inflammatory or a noninflammatory benign process, but the etiology of the lesion cannot be determined. Pulmonary abscess, gangrene and tumor show accelerated sedimentation rates without characteristic differences from those found in pulmonary tuberculosis.

Annales d'Anatomie Pathologique, Paris

15: 337-453 (April) 1938

Chronic Epithelial Nephritis and Bence Jones Proteinuria. P. Vuilleumier.—p. 337.
Morphologic Observations on Hyperergic Inflammation in Atrophic Muscular Tissue in Relation with the Participation of Nervous System in Allergic Reactions of Tissues. J.-M. Lasovsky and D.-N. Wyropajew.—p. 357.
*Anatomopathologic Considerations on Scarlet Fever Associated with Ulceronecrotic Sore Throat: Special View of Lesions of Neurosympathetic System. V. Anghelesco, S. Fasie and T. Poenaru-Companeitz.—p. 371.
Cyst of Internal Meniscus of Knee. L. Marchand and H. L. Guibert.—p. 389.
Lymphatics of Pyloric Portion of Stomach. C. Rohlich.—p. 401.

Scarlet Fever with Ulceronecrotic Sore Throat.—Anghelesco and his associates made anatomopathologic studies in seven cases of scarlet fever associated with ulceronecrotic sore throat. The tissues were fixed with 10 per cent solution of formaldehyde, with Bouin's fluid, with alcohol; the paraffin sections were stained with hematoxylin-eosin according to the methods of Nissl, Giemsa, Gram and others. In summarizing their observations the authors say that in the sphere of the nervous system the most important lesions are those in the cervical sympathetic chain. The other parts of the nervous system present lesions characteristic of severe toxemia. The lesions of the lymphoid system are general and important. In the posterior part of the throat they have the aspects of hypergic inflammatory lesions. The "reaction" of the histiocytic apparatus, such as it is, shows microscopic changes with the aspects of a deep lesion with sideration of these elements. Of the endocrine glands the adrenals are the most severely involved. Recent experimental studies demonstrated the repercussions which the toxic lesions of the sympathetic nervous system have on the morphology and functions of the lymphoid organs and of the endocrine glands. Attempts have been made to ascribe an important role in the physiopathology of scarlet fever to the sympathetic nervous system, particularly the nervous centers of the sympathetic ganglions. The authors think that their anatomopathologic observations can be taken as an argument in favor of this interpretation. They believe that in cases of scarlet fever with ulceronecrotic sore throat the clinical and anatomopathologic type is produced by latent lesions of the lymphoid organs and particularly by the nervous elements of the cervical chain. These lesions are due to repeated infections during earlier periods. The authors emphasize that their patients were of the adenoid type, the previous history disclosing infections of the cervical lymphoid organs. The lesions which they detected in the sympathetic nervous system become the anatomic basis to which certain authors apply the term constitutional fragility of the neurosympathetic apparatus. On this anatomic basis the clinical type characteristic of scarlet fever with ulceronecrotic angina develops. Although it may be difficult to affirm at the present time the importance of the effects of the sympathetic centers in the defense against intoxications, the question may be raised whether the alterations of the sympathetic nervous system, such as those observed by the authors, are not at least partly responsible for the insufficiency of the defensive processes of the organism.

Archives des Maladies du Cœur, Paris

31: 381-476 (April) 1938

*Terminal Infectious Endocarditis in Course of Old Rheumatic Endocarditis. A. Dumas.—p. 381.
Value of Leads 4 and 5 for Diagnosis of Myocardial Infarct of Type T1. E. Donzelot and M. Pelaez.—p. 393.
Dissociation of First Heart Sound: First Sound with Auricular Precession and Retarded Presystolic Gallop. C. Lian and J.-J. Welti.—p. 408.
Electrocardiographic Study of Carotid Sinus Reflex. J. Lenègre.—p. 421.

Terminal Endocarditis in Old Rheumatic Endocarditis.—Dumas directs attention to the relations between infectious endocarditis and rheumatic endocarditis, pointing out that some authors are of the opinion that the two disorders have a common etiology. The disease of Bouillaud and the disease of Osler are regarded merely as two different forms from the same infectious state directed by Streptococcus viridans. It acts by its toxins in the first case and it is detected by hemoculture in the second. A number of authors, especially Americans, have demonstrated Streptococcus viridans in repeated blood cultures in numerous cases of Bouillaud's disease. After pointing out that Weil and his collaborators reported three cases which favor this theory, Dumas presents four carefully studied cases, in three of which a necropsy was performed. One of these observations does not favor the theory of the common origin, because the port of entry of the infection that was superimposed on an old stabilized mitral endocarditis was brought into evidence with incontestable certainty, in that the infectious symptoms appeared following an abortion. In two other cases, however (the second and third), the transition was unnoticeable between the rheumatic crises of Bouillaud's type with negative hemocultures and favorable modification by sodium salicylate, and the last crises, which developed many years after, gave positive streptococcus hemocultures and had a fatal outcome. The necropsy revealed in these two cases exuberant vegetations of a recent type grafted on old, articular lesions, which certainly were contemporary with the first attacks. The fourth case described by the author raises the problem of an intestinal port of entry of the infectious agent, but here, as in the preceding observations, the transition between the evidently rheumatic crises of the early period and the crises of the infectious type during the terminal period does not permit final conclusions. The author points out that rheumatic endocarditis is a frequent disorder, particularly in its chronic form. It often becomes established after the multiple rheumatic attacks of childhood and adolescence, but in a number of cases its further development ceases after a certain time. There are many persons with mitral or aortic defects who lead an almost normal life and often reach an advanced age. Moreover, it is generally accepted that the lesions of rheumatic endocarditis are chiefly articular, retractable, old and nearly always cicatricial, whereas in the small number of subjects who much later (after ten, fifteen or twenty years) have an infectious endocarditis the lesions are quite different, without connection with the earlier ones and consisting of ulcerative processes or of vegetations that are superimposed on the old cicatrized ones. The author thinks that in view of this difference in the lesions and the difference in the clinical course, first of the rheumatism and later of the infectious state, it is impossible to speak of a common cause. In the reported cases the rheumatism of Bouillaud's type took on the aspects of Osler's disease after many years (twenty years average). This is the reason why, without deciding beforehand whether or not there is a common cause, the author designated this special type of endocarditis as "terminal infectious endocarditis."

Revue Médicale de la Suisse Romande, Lausanne

58: 257-320 (April 25) 1938. Partial Index

Exceptional Case of Inclusion of Biliary Vesicle in Liver with Intrahepatic Perforated Diverticulum. A. Charbonnier and E. Schauenberg.—p. 284.
*Typhoid in Those Vaccinated Against Typhic Infections. M. Monnier.—p. 301.

Typhoid After Vaccination.—On the basis of more than twelve years' experience with vaccination against typhoid and paratyphoid in a medical mission in Syria, Monnier states that anybody who is vaccinated with a vaccine containing eberthian strains has a good chance of remaining free from typhic infections, provided this vaccination is renewed every year. Unfortunately, there are rare cases of failure which might bring a valuable treatment into disrepute. The author observed typhoid in vaccinated persons but never a fatal case. The cause for the failure may be that the vaccination was repeated only at intervals of two, three or even five years; or, if repeated annually, the person may have been debilitated by amebic dysentery, malaria or other infection or he may have consumed heavily polluted water. The author gives a detailed clinical history of a patient who contracted typhoid after vaccination and says that he observed three other mild cases in patients who had become infected in regions where there were epidemics. On the basis of these observations, the author says that the onset of typhic infections in the vaccinated is identical with that in the nonvaccinated but that there is nevertheless a reduction in gravity and in duration. The recovery is rapid and the change in the general condition is slight.

Giornale di Clinica Medica, Parma

19: 469-558 (April 30) 1938

Metapleurisy in Right Side of Abdomen. D. Campanacci.—p. 469.
Diabetes Mellitus and Hypogenitalism. E. Rastelli and V. Rossi.—p. 477.
*Effects of Intravenous Administration of Small Dose of Epinephrine on Gastric Secretion Which Was Tested by Histamine and Also on Some Substances of Blood. C. Negri and G. Terzi.—p. 493.
Treatment of Uricemic Arthritis by Means of Piperazine Phenylquinolin-carbonate. D. Zappia.—p. 524.
Spasm of Esophagus from Cervical Hypertrophic Spondilosis Deformans. G. Pescatori.—p. 530.

Intravenous Injection of Epinephrine.—Negri and Terzi studied the effects of an intravenous injection of 0.02 mg. of epinephrine on the gastric secretion and on some substances in the blood of twenty-five adults. The study was carried out by determinations of the chemistry of the gastric juice and of the sugar and the substances in the blood which have diastasic and antitryptic properties. The tests were made in the course of the histamine test alone and combined with epinephrine. The authors conclude that the secretion of free hydrochloric acid during stimulation by histamine is modified by an intravenous injection of a small dose of epinephrine in persons who have a normal or increased secretion of the acid. In the majority of cases of this type the secretion of hydrochloric acid which is induced by histamine stimulation is inhibited by epinephrine and in a few cases it is increased. The secretion of free hydrochloric acid is not modified by epinephrine in persons who have achlorhydria or hypochlorhydria. The secretion of combined hydrochloric acid, the organic acids of fermentation and the peptic ferments of the gastric juice, as well as the amount of substances which cause diastasis and antitryptic properties to the blood, do not change in the course of the histamine test when used alone or in combination with epinephrine. There is a slight lowering of glycemia in the course of the histamine test, whereas there is a moderate transient hyperglycemia early in the course of the combined histamine and epinephrine test. The authors believe that the results of the studies show a relation between contraction of the spleen and the secretion of hydrochloric acid by the stomach. A normal output of splenic blood regulates the secretion of hydrochloric acid, whereas a diminished output results in the production of hypochlorhydria or achlorhydria. The authors' statement seems to be supported by the fact that the gastric chemism is disturbed in all cases of splenomegaly from defective contraction of the structure and that this form of splenomegaly plays an important part in the pathogenesis of gastric and gastroduodenal diseases with disorders of the gastric secretion.

Policlinico, Rome

45: 841-892 (May 2) 1938. Practical Section

*Ucko's Reaction in Comparison to Induced Curve of Amino Acids in Blood in Pulmonary Tuberculosis. A. Rubino.—p. 841.
Treatment of Chronic and Acute Gonorrhea and Its Complications in Men by Para-Aminophenylsulfamide. V. Tommasi.—p. 847.
Dextrose in Cerebrospinal Fluid During Shock by Insulin Treatment in Schizophrenia. M. Fischer.—p. 851.
Torsion of Gallbladder. E. Giupponi.—p. 852.

Ucko's Reaction in Pulmonary Tuberculosis.—Rubino says that opinions in the literature on the value of Ucko's test for the functioning of the liver are conflicting. He followed the behavior of the reaction in 200 patients who were suffering from pulmonary tuberculosis. He found that the test gives strongly positive results in 40 per cent of the cases, slightly positive results in 30 per cent and negative results in 30 per cent. Strongly positive reactions correspond to grave forms of tuberculosis as well as those of long duration and when the patients are in poor nutritional condition. Slightly positive and negative results correspond respectively to chronic and benign forms and to tuberculosis recently developed or during recovery of the patients who are in satisfactory nutritional condition. The sedimentation speed parallels the results of Ucko's test. The author made a comparison of the results of Ucko's test with those of the tolerance test of aminoacetic acid, which are ascertained by the curves of amino acids in the blood before and fifteen, thirty and sixty minutes after the intravenous injection of 1.2 Gm. of aminoacetic acid. The results of the tests parallel each other only in 50 per cent of the cases. The author concludes that Ucko's test is of value in the diagnosis of pulmonary tuberculosis and in estimating its intensity but that it has no value for the functioning of the liver.

Bol. de la Soc. Cubana de Pediatria, Havana

10: 147-194 (April) 1938

Asthenic Habitus: Clinical Importance in Future of Children. B. Soria.—p. 155.
Abnormalities of Urinary Tract: Importance in Presence of Chronic Pyelitis. G. Cardelle.—p. 159.
*Magnesium Sulfate in Whooping Cough. E. Soto Pradera.—p. 173.
Puericulture. Esperanza Costa.—p. 183.

Magnesium Sulfate in Whooping Cough.—Soto Pradera calls attention to the value of magnesium sulfate as a symptomatic treatment of whooping cough. He gave daily intramuscular injections of a 10 per cent solution of magnesium sulfate to forty patients (thirty-eight infants and children and two adults). The dose varied from 0.25 to 1.1 cc. per kilogram of body weight until from fifteen to twenty injections had been given, according to the stage of the disease. The patients' urine was normal before, during and after the treatment. The crasis of the blood did not change. There was a decrease in coughing and vomiting early in the course of the treatment in thirty cases, with consequent clinical control of the disease after about fifteen injections. The treatment failed in ten cases. According to the author the treatment has an antispasmodic and sedative effect, by which the evolution and duration of whooping cough are favorably modified. The results were better than those he obtained in a group of 107 cases which were managed by the administration of common symptomatic treatments (antipyrine, belladonna, sodium bicarbonate and ether by rectum). Chronic nephritis contraindicates the treatment. Satisfactory results have been previously reported in Argentina. The author advises the preparation of a 50 per cent solution of magnesium sulfate instead of the 10 per cent solution which he used and to give the injections in doses of 0.2 cc. per kilogram of body weight. The dose is well tolerated and the volume of the injection is smaller than that used in more dilute solutions and causes neither pain nor local inflammatory reaction.

Archiv für Gynäkologie, Berlin

165: 317-712 (March 25) 1938. Partial Index

Clinical Aspects of Vaginal Cesarean Section. E. Puppel.—p. 317.
Influence of Hormone of Male Gonads on Infantile Ovaries. H. Groher.—p. 347.
*Puerperal Sepsis Caused by Gas Bacillus. E. Tscherne.—p. 374.
Pathologic and Clinical Aspects of Dysgerminoma Ovarii. V. Föderl.—p. 392.
Menarche and Its Relations to Pigmentation. L. Ley.—p. 489.
Malnutrition and Impairment of Germ Cells. A. Bayer.—p. 591.

Puerperal Sepsis Caused by Gas Bacillus.—Tscherne asserts that the puerperal sepsis caused by the gas bacillus takes a special position among the various forms of puerperal sepsis. That this form has been given little attention in the gynecologic literature he ascribes to the comparative rarity and to the fact that it is often not correctly identified; this applies especially to patients who survive the acute stage and later succumb to the renal changes. The author surveys the cases of puerperal gas bacillus sepsis that were observed at the women's clinic in Graz in the course of the last five years. He differentiates three groups and describes and discusses cases of each group. The first group includes women who die within a short time as the result of acute symptoms. The author ascribes this rapid course, on the one hand, to a severe intoxication of the organism by the protein products resulting from the breakdown of tissues, by the gas bacillus, on the other hand, to the impairment of the blood and the resulting reduction in oxygenation. The second group includes those women who survive the acute symptoms but in whom, after a temporary improvement, signs of severe uremia develop, to which they finally succumb. The cause of the severe functional disturbance of the kidney, which may lead to complete anuria, is generally an interstitial nephritis, and in addition to this there often exists a toxic impairment of the epithelium of the uriniferous tubules and an obliteration of many tubules with masses of methemoglobin. In spite of slow regeneration of the tubular epithelium and in spite of an increase in the

quantity of urine, the uremic manifestations advance rapidly, probably because of the presence in the blood stream of large quantities of protein waste products derived from the breakdown of tissues and blood corpuscles, the impaired kidney being no longer able to eliminate them. In addition to these renal changes, the author observed a case with spotty necroses in the kidney which were the result of vascular impairments that occur in hyperergic conditions. The author explains the possible development of such a hyperergic state in puerperal women. The third group of women includes those who recover from the puerperal gas bacillus sepsis following treatment with gas edema. He describes three cases of this type but emphasizes that the administration of gas bacillus serum promises success only if it is given early and in large doses. The reported case histories indicate that the polyvalent antitoxic gas edema serum may be given intravenously in quantities of 40 or 50 cc., that intramuscular injections of the serum may be given simultaneously or that streptococcus and anaerobic serum may be given in combination with it. In view of the fact that the early recognition of the gas bacillus sepsis is of great importance for the treatment, the author stresses that whenever after a birth or abortion an icterus develops or the urine is scanty and reddish, gas bacillus sepsis should be thought of and a bacteriologic examination should be made on specimens of blood, urine and placental tissue.

Archiv für klinische Chirurgie, Berlin

191: 547-806 (April 8) 1938. Partial Index

Treatment of Fractures of the Vertebrae. G. Magnus.—p. 547.
Malleolar Pseudarthrosis. P. Rostock.—p. 557.
Penetration of Thorax with Sharp Instrument with Cardiac Pulsation Transmitted to Foreign Body. E. Wetzel.—p. 594.
Surgery of the Perforated Gastric Duodenal Ulcer. L. Nicolas.—p. 602.
*Observations on Patients with Urinary Calculi Treated in the Jena Surgical Clinic During Last Ten Years. H.-A. Dege.—p. 632.
*Exophthalmic Goiter and Thyrotoxicoses. B. Breitner.—p. 754.

Urinary Calculi.—Dege observed the patients with urinary calculi treated in the Jena Surgical Clinic during the last ten years and states that improvement in roentgenologic technic due to introduction of the various contrast mediums and excretory urography within recent years makes it possible to demonstrate the presence of most stones, even those which cast a faint shadow. He had noted certain similarities between precipitation of urinary calculi and immunologic precipitation reactions. What is of importance is that the disturbance of the colloidal state necessary to bring about the original precipitation of a calculus in the urine need be of but short duration. This disturbance may no longer be demonstrable at the time of the passage of the stone. The primary disturbance plays no part in the growth of the stone. The author therefore draws a sharp line between the precipitation of a calculus and its growth. Precipitation of a calculus is the result of an important though transitory alteration in the general reactivity of the organism. It is not known just how this alteration effects the urine of the renal pelvis. It is possible that the influences originate in the circulation, perhaps as a disturbance in the peripheral blood vessels. The demonstrable relationships to the immunologic status of the body and to the vitamin economy suggest that precipitation of calculi is an expression of a disturbance in a profound and primitive body function. The cause of this disturbance is obscure in most cases or is incompletely revealed. The growth of the calculi is favored by the existence of secondary lesions. These may be exogenic in character, such as geographic peculiarities or type of nourishment; local, such as infection of the urinary passages, or anatomic changes; or they may be endogenous in character, owing to the alterations in the internal secretions or to heredity. The treatment has for its object the removal of the stone and the correction of the conditions favoring its growth.

Exophthalmic Goiter and Thyrotoxicoses.—Between 1921 and 1931, Breitner had operated on ninety-six patients presenting thyrotoxicosis and sixty-one presenting exophthalmic goiter. Of fifty patients whom he attempted to follow up, twenty-two gave reliable answers. He observed that complete development of the clinical picture coincides with enlargement of the thyroid and that operation in these cases results in a complete and lasting cure. The term "Morbus Basedow" is purely a clinical one. It may be further supported by the evidence of a characteristic Basedow thyroid, the only contradictory evidence against which is the occasional finding in young persons of microscopic alterations characteristic of a genuine Basedow thyroid in the absence of all clinical manifestations of the disease. There are likewise occasional cases presenting clinical signs of exophthalmic disease without microscopic alterations in the thyroid characteristic of the disease. One must assume in such cases a "basedowification" of a colloid goiter or the development of a toxic adenoma, or some other functional change in a person with an exophthalmic constitution. The author concludes that the microscopic picture alone does not establish the diagnosis. Neither does it alter the clinical diagnosis. The thyroid in a case of acute exophthalmic goiter caused by a psychic upset will not show a typical microscopic picture of a genuine exophthalmic goiter. The gland here is in a state of increased functional activity. The psychic treatment has its place in the beginning. However, when the gland itself becomes a factor in the disease, the best results are obtained only by an attack on it. One must assume an exophthalmic constitution for the genuine cases of exophthalmic goiter. The causative factor may be a psychic insult or a disturbance in the endocrine balance (puberty, menopause, pregnancy). The purely functional origin of alteration leads in the course of the disease to morphologic alterations within the thyroid. The thyrotoxic state may be temporarily favorably modified by exhibition of iodine and thus reduce the hazards of the operative intervention. The effect of iodine therapy is most pronounced in the genuine cases of exophthalmic goiter. That is not the case in toxic adenoma, in which the iodine balance is entirely different from that in the exophthalmic goiter. The effect of iodine therapy in cases of septic origin designated by E. P. Sloan as "anaphylactic type" has not been worked out. In all the types, however, operative reduction of the size of the thyroid to the permissible minimum is the therapy of choice. The author finds that separate extracapsular ligation of all the four arteries of the thyroid does not enhance the therapeutic result.

Klinische Wochenschrift, Berlin

17: 489-520 (April 2) 1938. Partial Index

Cevitamic Acid and Blood Protein Picture. A. Jezler.—p. 492.
Pathogenesis of Causalgia. A. Meyer.—p. 494.
Recent Investigations on Chronic Gastro-Enteritis. H. Bohn.—p. 497.
Heat Coagulation Test in Human Cerebrospinal Fluid. H. Rosegger.—p. 498.
*Hydrochloric Acid-Collargol Reaction, New Test of Cerebrospinal Fluid. C. Riebeling.—p. 501.
Disturbances of Calcium Resorption and Appearance of Tetany in Course of Chronic Catarrh of Small Intestine. G. Hetényi.—p. 506.

Hydrochloric Acid-Collargol Reaction in Cerebrospinal Fluid.—Riebeling says that the reaction described by him differs in principle from all former reaction in that it protects a colloid against a precipitating acid by means of cerebrospinal fluid in different dilutions. His reaction requires a freshly prepared five hundredth normal hydrochloric acid, made from tenth normal hydrochloric acid, and a solution of collargol (a preparation consisting of colloidal silver and silver oxide), which is prepared freshly from a 1:1,000 stock solution. Of a series of carefully cleansed tubes, of the type that are used for Wassermann tests, the first one contains 0.5 cc., the second 0.8 cc., the third 0.9 cc., the fourth 1.4 cc. and the fifth 1.9 cc. of five hundredth normal hydrochloric acid. Then are added 0.5, 0.2, 0.1, 0.1 and 0.1 cc. of cerebrospinal fluid. From the fourth tube, after thorough mixing, 0.5 cc. is withdrawn; from the fifth tube 1 cc. is taken and pipetted into the sixth tube; 1 cc. is pipetted into the seventh and so on to the twelfth tube. Thus the tubes contain the following dilutions of cerebrospinal fluid: 1:2, 1:5, 1:10, 1:15, 1:20, 1:40, 1:80, 1:160 to 1:2,560. To each of these dilutions is added 1 cc. of the collargol solution. Then the tubes are shaken by hand and are left standing for at least six hours. It is best to take the final reading the following morning. The author says that the method is simple, economical and easy to read. The difference between the positive and negative reaction is quite clear. Discussing the evaluation of the reaction the author says that this is easy only if the test is made together with one of the more customary reactions, usually the mastic or the colloidal gold chloride test. With the usual colloid reactions a differentiation between paralysis and cerebral syphilis

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is not always possible and a cerebrospinal fluid from a patient with tumor may simulate a reaction for paralysis; however, in the hydrochloric acid-collargol reaction noticeable differences can be seen. Moreover, the latter reaction shows greater differences in the cerebrospinal fluids from cases of meningitis and of syphilis. The mastic and colloidal gold reactions do not always do this. Thus the described reaction is suited especially for these cases. It is of value also in cases in which there is a slight increase in protein, in which the mastic and colloidal gold tests generally fail.

Medizinische Klinik, Berlin

34: 381-420 (March 25) 1938. Partial Index

Recognition and Treatment of Addison's Disease. H. Reinwein.—p. 381.
Hyperemesis Gravidarum. J. Meinertz.—p. 388.
Practical Test of Functional Capacity of Heart in Children. F. Hamburger.—p. 391.
Orthostatic Albuminuria. E. Becher.—p. 392.
*Fatty Degeneration of Cardiac Muscle in Deficient Oxygenation of the Blood. K. Hitzenberger.—p. 394.
*Pulsation of Jugular Vein in Ascites. E. Lauda.—p. 396.
Therapy of Myocardial Infarct. K. Blumberger.—p. 397.

Fatty Degeneration of Cardiac Muscle.—Hitzenberger says that the fatty degeneration of the cardiac muscle is clinically designated as "tigering." In reviewing the literature he shows that qualitative and quantitative changes in the blood are the chief factors in the development of tigering. It has been known to develop in a rather severe form in deficient hemopoiesis, especially in pernicious anemia. It is observed also in infectious diseases, such as diphtheria, scarlet fever and sepsis; in certain intoxications, in case of impairment of the coronary arteries and in pericarditic exudates that exert pressure. Then it is found as the final stage of hypertrophy of the cardiac muscle in valvular lesions, chronic disorders of the kidneys, emphysema, kyphoscoliosis and so on. In investigations on the influence of oxygen deficiency on organic functions, the author noticed tigering of the cardiac muscle in a case of symptomatic polycythemia in pulmonary emphysema. Later he observed four other cases of this type. In view of the fact that tigering of the cardiac muscle is usually ascribed to anemia, this observation at first surprised the author and so he investigated the problem further. He found that fatty degeneration of the cardiac muscle is the result of a deficient oxygenization of the blood. It develops in cases of polycythemia, when a hypoxemia of the arterial blood, resulting from an insufficiency of the respiratory organs, exists simultaneously. The tigering does not involve the entire heart uniformly but affects some parts more severely than others, in spite of the fact that the injurious factor acts on the entire heart. The most frequent localization of the tigering seems to be the left, large papillaris muscle. In one report on the distribution of the fatty degeneration, the chief localizations were mentioned in the following order: the cardiac stimulus conduction system, the left large papillaris muscle, the left and right cardiac walls, the right large papillaris muscle. It appears that those parts of the heart are most severely involved which functionally are most active. This seems to indicate that during hypoxemia these parts already receive an inadequate supply of oxygen, when for the less active parts the oxygen supply is still adequate. The simultaneous existence of diseases of the coronary arteries seems to promote fatty degeneration.

Pulsation of Jugular Vein in Ascites.—Lauda says that, when in cases of severe ascites a pulsation of the jugular vein was synchronous with the apical impulse of the heart, it was often regarded as a justification for the diagnosis of tricuspidal insufficiency. However, a more exact examination revealed the incorrectness of this assumption. The observed positive venous pulse was not a regurgitating one for in response to digital compression of the distal section of the vein either the jugular vein became empty or the venous pulse lessened in the almost empty vein. The most peculiar aspect of the pulse was that it changed with the position of the patient and that in certain postures it disappeared entirely. The topographic relation of the aorta to the upper vena cava seemed a possible explanation of the transmitted pulse. The aorta, because of its nearness to the vena cava, in case of elevation of the diaphragm and of the involved turning of the heart, is pushed close to the vena cava, so that the ascending part of the aorta is pressed into the vena cava and the aortic pulse is transmitted to the blood in the vena cava superior and also in the jugular vein. When the positional relation of the aorta to the vena cava becomes less close as the result of a postural change in the patient, the jugular pulsation is lessened or disappears completely. It was found that the phenomenon occurs chiefly in cases of ascites in which the heart is of normal size; that is, in cirrhosis. In cardiac insufficiency with ascites and diaphragmatic elevation, on the other hand, it is either absent or of a mild degree. The author thinks that this might be due to the fact that an enlarged heart is not so prone to change its position. Moreover, it appears that a slight stasis of the jugular vein or of the vena cava favors the development of the phenomenon, whereas the excessive filling of the venous circulation in case of cardiac stasis inhibits the phenomenon.

Zeitschrift für Orthopädie, Stuttgart

67: 321-432 (April 12) 1938. Partial Index

*Dyschondroplasia (Multiple Enchondromatosis—Ollier's Disease). E. Gäde.—p. 321.
Congenital Wing Membrane and Its Conservative Treatment. W. Marquardt.—p. 379.
*Spontaneous Cure of So-Called Congenital Dislocation of Hip Joint: Ten Cases. S. Nagura and Y. Shirahama.—p. 387.
Form and Function of Feet of Mountain Nomads in Anatolia. S. Irmak.—p. 396.

Chondrodysplasia.—Gäde directs attention to the fact that there is much confusion in the terminology of Ollier's disease. He says that the term chondromatosis is employed rarely. In the romance literature the term dyschondroplasia is in use. In the English literature the term chondrodysplasia is generally applied to the disease that was described by Ollier. In the German literature the term "Ollier's growth disturbance" has been in use and has been identified with the unilateral type of chondrodysplasia. As such it has been strictly differentiated from the bilateral form of the same disease. The author shows that this differentiation is not justified. Before giving his opinion about the terminology he reports five cases. The first one was a bilateral, multiple chondrodysplasia of the skeleton, the second one a multiple chondrodysplasia of the left hand, the third one a multiple chondrodysplasia of both hands and of the left foot, the fourth one a multiple chondrodysplasia of the right hand and the fifth one a chondrodysplasia of the fourth finger of the left hand. Surgical measures, such as supracondylar osteotomy, removal of chondromatous masses and implantation of bone splints produced favorable results. In order to clarify the problem of terminology of Ollier's disease, the author reviewed and compared ninety cases of multiple chondrodysplasia from the literature. He demonstrates that there is no unilateral type of chondrodysplasia, which in the German literature is identified with "Ollier's growth disturbance," but that there is only a more or less disseminated chondrodysplasia. The author says further that, although chondrodysplasia has been regarded as a hereditary disorder, there is no justification for this. The author found likewise the predominance of chondrodysplasia in the male sex not as great as had been stated by some authors. In order to throw light on the etiology, interferometric measurements were made on the blood in three of the author's cases. The results indicate that certain hormones might be regarded as having a causal role but as yet these observations should be estimated with great reserve. The prognosis of the disorder as regards malignant degeneration is favorable. The treatment should be surgical if possible; the chondromatous masses should be removed in order to avoid the development of deformities and spontaneous fractures. If deformities have already developed, the treatment should be partly a conservative-orthopedic one and partly an operative-correcting one.

Congenital Dislocation of Hip Joint.—Nagura and Shirahama made roentgenologic studies in ten cases in which congenital dislocation of the hip joint healed spontaneously. They observed spontaneous cure on both sides in two cases of bilateral dislocation and on one side in eight cases of bilateral dislocation; that is, twelve joints were cured spontaneously. The ten cases were found among a material of 128 cases. The authors conclude from the observations on this material that spontaneous cure of congenital dislocation of the hip joint occurs more often than has been assumed heretofore.

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Wiener klinische Wochenschrift, Vienna

51: 449-472 (April 22) 1938

*Therapy of Thrombopenic Purpura by Means of Kephrine Hydrochloride. H. Fleischhacker.—p. 449.
Urgency of Interventions After Injuries on Skull. R. Mauritz.—p. 451.
Recent Opinions on Coagulation of Blood and Hemostasis. F. Schürer.—p. 453.
Ultra Short Waves in Treatment of Poliomyelitis. A. Colarizi.—p. 456.
Manner of Disappearance of Delusions in Patients with Progressive Paralysis Who Have Received Malaria Therapy. V. Vujić.—p. 458.
Physical and Balneologic Therapy of Disturbances of Peripheral Arteries. A. Mládek.—p. 460.

Therapy of Thrombopenic Purpura by Kephrine Hydrochloride.—Fleischhacker says that since a report by Klima about the favorable effects of kephrine hydrochloride in patients with thrombopenia, he used this preparation in a number of cases. He admits that in the acute, particularly the anaphylactic, form the estimation of the efficacy of kephrine hydrochloride is difficult, because in such cases the hemorrhages usually stop when the medicament against which the patient is hypersensitive is discontinued. More convincing are the results that are obtained in the chronic essential thrombopenias. In some of these the thrombocytes are reduced; there is a positive Rumpel-Leede stasis phenomenon and the slightest injuries cause extensive hematomas. These cases, as a rule, responded rapidly to treatment with kephrine hydrochloride. The hemorrhagic tendency could usually be arrested and the appearance of new hemorrhages stopped after one or two days of treatment. The thrombocytes usually increased. In some of the cases, normal figures could be obtained during the time of intensive treatment. The quantity of kephrine hydrochloride which is necessary to arrest the hemorrhages differs in the individual cases. As a rule the oral administration is sufficient, but during the acute stage it can be supported by intramuscular injection. When a certain degree of coagulability had been reached in chronic cases, the author usually discontinued the treatment. When this was done the thrombocytes often decreased again and hemorrhages recurred, but renewal of the treatment usually reestablished normal conditions in a comparatively short time. In the chronic cases, in which the thrombocyte values are constantly low, it will have to be decided whether continuous medication with kephrine hydrochloride will be sufficient or whether splenectomy will be necessary. In this connection the author points out that, even after splenectomy, recurrences have been known and that splenectomy involves a comparatively high mortality. In cases in which thrombopenia and hemorrhages recurred several years after splenectomy and in which all measures failed, kephrine hydrochloride proved effective. Moreover, the administration of kephrine hydrochloride may be valuable in preparing the patient for a splenectomy. In two cases of hemorrhagic diathesis in which thrombopenia developed as the result of an acute myeloblastosis, however, medication with kephrine hydrochloride failed completely.

Problemy Tuberkuleza, Moscow

Pp. 1-148 (No. 12) 1937. Partial Index

Anatomopathologic Classifications of Pulmonary Tuberculosis. V. G. Shtefko and V. T. Puzik.—p. 4.
Hematogenous Types of Pulmonary Tuberculosis. M. P. Borok.—p. 16.
Nourishment in Tuberculosis. L. M. Model.—p. 32.
Blood Transfusion in Chronic Tuberculosis of Lymph Nodes and Serous Surfaces. Va. O. Krizhevskiy.—p. 40.
*Early Artificial Pneumothorax. P. B. Torkanovskiy.—p. 44.
Errors in Induction and Maintenance of Artificial Pneumothorax. A. S. Furman.—p. 55.

Early Artificial Pneumothorax.—Torkanovskiy reports his observations on the changes produced in the normal lungs by artificial pneumothorax. He had subjected fifteen patients with epilepsy to artificial pneumothorax with the view of diminishing the number of attacks. The patients were first studied as to the circumference of the chest, the height, weight, spirometry, pulse, respirations, blood pressure, roentgenograms, p_H of the blood, alveolar tension, basal metabolism, potassium and calcium blood content, erythrocytes, blood albumins, acid-base index of the urine and blood gases. Gradual repeated insufflations, begun on the left side and extended to the right side, were carried out until 1,000 cc. of air was introduced into each pleural cavity. There were no complications of any kind. Subjective complaints of difficulty in breathing in the course of the first day occurred only in cases in which 1,000 cc. of air was introduced into each pleural sac in one sitting. A complete collapse of the left lung, persisting for from two to three weeks, was obtained only after repeated inflations of 1,000 cc. of air. The author was not able to obtain a total collapse of the right lung in any case. The alterations in the pulse, respirations and blood pressure following the introduction of pneumothorax after the first as well as after repeated insufflations were so insignificant as to suggest that pneumothorax causes no alterations in a normal lung. The acid-base metabolism remained uninfluenced. The erythrocyte count and hemoglobin remained about the same. There was no exudation into the pleural sac in any of the cases. The alterations noted were those of loss of weight and the diminution in the circumference of the chest of from 1 to 4 cm. The author was not able to confirm the original hypothesis underlying the pneumothorax therapy of epilepsy; namely, the shift from alkalosis to acidosis. He suggests that the beneficial effect on epilepsy may be due to the action of the inflated air on the sympathetic and parasympathetic nerve fibers running in the pleural leaves. He concludes that the fewer pathologic alterations in the lung, the safer the induction of pneumothorax. He therefore takes exception to the widely adopted notion that one must demonstrate a cavity and tubercle bacilli before resorting to the collapse therapy and suggests that the method be applied in earlier cases—those with positive roentgenograms and signs of progression.

Nederlandsch Tijdschrift v. Geneeskunde, Amsterdam

82: 1549-1682 (April 2) 1938. Partial Index

Studies on Basal Metabolism of Children. M. De Bruin.—p. 1557.
*Atropine Therapy in Postencephalitic Parkinsonism: Results and Complications. F. Grewel.—p. 1569.
Ocular Complications in Weil's Disease. M. S. Koster.—p. 1577.

Atropine Therapy in Postencephalitic Parkinsonism.—Grewel describes five years' experiences with ambulatory atropine therapy in patients with postencephalitic parkinsonism. Observations on about thirty patients convinced him that the medication must be individualized, for whereas some patients may tolerate the oral administration of 10 or even 12 mg. of atropine sulfate three times daily, others may not be able to tolerate even much smaller does. The author never increased the dosage to more than 35 mg. a day, because such large doses involve the danger of complications. As a rule, the daily dose does not exceed 7 or 9 mg. Moreover, even in the individual patient the tolerance for atropine sulfate may change in the course of time. The optimal dose often may become somewhat reduced in the course of years so that it seems justified to inquire whether, in addition to the symptomatic effect, atropine sulfate may not also have a causal therapeutic influence. In some patients, who in the end felt comparatively well without medication and in whom only a certain stiffness remained, such a possibility may be considered. Sudden interruption of the medication involves danger, because of the symptoms of abstinence; however, the dangers of irregular medication are probably negligible. Discussing the symptoms that are favorably influenced by the atropine medication, the author mentions rigidity, amyostasia and other coordination disturbances. The reduction in tremor is often quite striking and this is a great encouragement for the patients. The visual cramps, the pulsation phenomena and the hypersalivation are likewise favorably influenced and the immobile facies disappears almost entirely. Speech disturbances, involuntary laughter, tics and spastic torticollis are hardly at all influenced. It is noteworthy that the psychotic symptoms often disappear under the influence of treatment with atropine. On the whole, the author found the effects of the atropine therapy satisfactory, but he is unable to share the great enthusiasm that at first prevailed, because, as is indicated by the persisting speech disturbances, the coordination is never completely restored. In giving his attention to the disorders that may result from continued atropine therapy, the author mentions paranoid and hallucinatory psychoses. In several of his patients a paranoid psychosis developed. He describes these cases and suggests that the cerebral damage and the chronic intoxication work together in the elicitation of this psychosis.

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